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WILSON'S
OUTLINES
OF
NAVAL SURGERY.

46.

1679.

OUTLINES

OF

NAVAL SURGERY.

BY

JOHN WILSON, (D.)

SURGEON, R. N.

LATE SURGEON, H. M. S. VANGUARD.

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TO

SIR WILLIAM BURNETT,

K.C.H., M.D., F.R.S.,

DIRECTOR-GENERAL OF THE MEDICAL DEPARTMENT OF
THE ROYAL NAVY.

SIR,

The following pages are dedicated to you with the greatest respect.

As the Director-General of the Naval Medical Department, it is proper that every work, written on the Health or Diseases of Seamen, should so be.

It seems unnecessary to state, at this moment, what may be the importance of the subject herein, however imperfectly treated, to, or its connection with, the best interests of the British as a maritime nation—health is strength,—without it, it is easy to see, no ship, and no fleet, can be efficient or capable of doing their duty.

To you, as Chief of the Naval Medical Department, a debt of gratitude and respect from the medical officers of every grade, it is but proper to say, is justly due—for your able and upright conduct in all official dealings, urbanity of manner, and an exertion unceasing in their behalf.

I have the honour to be,

SIR,

Your obedient and very humble servant,

JOHN WILSON, (D.)

Surgeon, R. N.

GRAHAMSTONE, STIRLINGSHIRE,
Jan. 1846.

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OUTLINES

OF

NAVAL SURGERY.

CHAPTER I.

PART I.—EXAMINATION OF SEAMEN.

In all ships of war, this is an important and very frequently occurring point of medical duty. On it much depends in various ways. It is important to the service and to the surgeon. At all times it influences, and that most materially, the ship in her character and capability. The examination of seamen loosely conducted, or in any way imperfect or improper, is in all cases detrimental both to the general health and energy.

In raising a crew, or manning, through the zeal of some officers, or their anxiety to complete, too much haste is often displayed. Men are too often entered, who, through defects, natural or acquired, are unfit. In some, disease or defects are naturally so deep or obscure, as not to be easily detected, and, through the scarcity of men, claims or long service, some are tolerated or imprudently admitted.

In whatever way this duty may be at first performed, its effect on the ship's character is commonly lasting. A crew at first good, or carefully selected, is for ever after, nine times in ten good, and a crew at first bad, or carelessly gathered, is, throughout all the commission after, as often bad, and both in constitution and character.

In a ship's company badly, or hastily selected, all the weeding or invaliding of the following three years, will in most instances barely make up for, or correct what has been effected through the carelessness, or what may be called indiscretion, of the first three months, or convert into a wholesome efficient crew, what was bad originally. A crew, at first formed of materials discordant or disagreeable, seldom mix, and rarely or never amalgamate, possessed of dissimilar notions or nature, such masses of men are generally depraved, diseased, or unruly, forming generally in the end a ship's company sickly, lazy, or inefficient.

In all examinations among seamen newly raised, caution and careful inquiry become indispensable. The first inspection, or medical examination, is what may be called the portal or strainer, through this, all who are serviceable ought to pass, and by this, all ought to be rejected or objected to, who are unfit. Into a ship, or the service, men may be easily entered, but not so discharged. The entry into the service is one thing, the exit another. Over the first, the officer commanding has always full power, over the latter none, which can only be accomplished by an admiralty or admiral's order, or that of a medical survey. Chronic disease is slow, and, under ordinary circumstances, usually long latent; but by time or circumstances, in most developed. Bad or stormy weather, or hard sea service, are tests very soon, both of the strength of a crew and their capability.

Every man, whether seaman or marine, ought to be examined by his own surgeon, that is, by the surgeon of his own ship, and no matter whither, or from whence he came, or whether previously examined, and always before entry. By carelessness or inadvertence, something during the previous examination may have been omitted, or it might have been superficial or unscientific. In this, however, the surgeon of the ship is most deeply concerned. By no other than he can the same interest be felt, or care taken. From rendezvous establishments, guard-ships, and such like, come the bulk of chronic cases, of constitutions shattered or undone, or subjects who are unfit, who in their examination have been only glanced at, or glossed over by those who were little interested, or were in this matter in a manner wholly unconcerned.

From the general constitutional condition of the men, will the character of the ship be formed, or according to the state and nature of the one, will be that of the other;—she will be happy, healthy, and effective, or sickly and disunited,—the character of the compound whole, being the necessary consequence of that of the ingredients acting.

Life at all times is uncertain, but particularly at sea. Sailors soon put on the symbols of age. Manhood, or the meridian of life with them, is soon over. For action or sea duty, youth is the period. The serviceable or really working period of a sea-going seaman's life, is about twenty years—from twenty to about forty.

Under twenty, sailors are soft and unseasoned, beyond that, they become more firm and more seasoned; but at, or about forty, begin to break down. Complaints with them then become much more frequent, and much more unmanageable, they become rheumatic, asthmatic, stiff in their joints, sullen, and very often discontented—the consequences of privation, broken rest, exposure, and a life hard spent.

The race of sailors is by no means tall,—they rarely reach six feet,—the majority of them being of the middle stature, from five feet four to eight. Sailors in their nature are thoughtless, indifferent about the present, and equally so about the future, loose in their attachments, witty, shrewd, regardless of danger, fond of change.

The duties of a ship at sea are active. For this, men are required who are young,—duties which to the feeble, or those in years, are unsuited.

The congregate body of an efficient sea-going crew, should be in manhood—two-thirds between twenty and thirty, and one-third above. Among seamen newly raised, the inspection or medical examination must tend, not only to the constitutional condition of the individual, but to age and stature. A man may be sound, but still, from the smallness of his frame, or natural inability, useless in a large ship. In large numbers, a few individuals of this description would probably be but little felt, but in a small crew most seriously, or, if numerous, even in a large one. With the rate of the ship, or the weight of sails and guns, the strength of the crew must at all times correspond, large ships require large robust men, small ships those more light.

With every care, men damaged in character or constitution, will creep into all ships, arising from the natural obscurity of chronic disease or concealment.

The period which may be called probationary in the career of a ship's company, is the first year of the ship's commission, and the first part of the second. During this period constitutions are tested, and cases and character found out. This period, then, is generally of the whole commission, the weakest, the most sickly, and the least efficient. From this, that is from the middle of the second year, the character of the ship's company in general improves. During this probationary period, those who are damaged in character or constitution are in general, in some way, found out, and in some way or other got rid of. The period by far the most healthy, efficient, and serviceable of the whole commission, is the last part of the second year, and all subsequent. By this time, assimilation to the manners, habits, and living of seamen has been effected, and organization and discipline established.

From the middle of the second to the third or fourth year, improvement is generally progressive. By this time those who were at first young men, have become formed and robust, those who were first-class boys have become young men, and those who were at first second-class, first; and by three or four years, or the time when the ship comes to be paid off, all have arrived at what may be called tolerable perfection.

Points to be attended to, or more peculiarly studied in the examination of seamen, are, in the first place, malformation or faulty structure; in the second, the presence or consequence of morbid action. Chronic disease is naturally obscure, and often difficult to detect. In all cases, circumspection and minute inquiry become indispensable.

Malformation may be natural or it may be acquired, that is, it may be congenital, or produced by accident.

In every serviceable seaman, the form or symmetry of the body ought to be complete,—muscles full, firm, and well shaped,—bones without irregularity or distortion,—limbs flexible, joints free.

Head normal, without marks or scars, and without any unusual elevation or depression. Giddiness, fainting, or fits,—cerebral or cardiac disorders of any description, are all incompatible with the sea service.

Hearing must be complete. In cold, bad, or stormy weather, and duties aloft, a deaf sailor would be useless. There must be no polypi or obstruction in the auditory passage, and no unnatural discharge.

Sight must be perfect. Cataract, corneal opacity, amaurosis, fistula, or tarsal disease, are all inconsistent with the duties of an able seaman.

In the nose there ought to be no obstruction or polypus. If a tumour should be small, of some standing, and benign, the case may be trifling, but an enlargement of sudden growth, of some size and painful, will detract, and that most seriously,—in other words, the man will be unserviceable.

In the mouth, all must be perfect. There ought to be no defect in gums, teeth, or palate, no tonsillary enlargement, and no ulcerative action. Speech must be perfect, without stop, stammer, or impediment. In seamen, fluency in speaking is desirable, in officers, particularly those of the executive kind, who are likely to command, indispensable.

The thorax, in a serviceable man, ought to be well formed, neither too prominent nor too flat. Viewed posteriorly, the spine ought to be strait, the ribs convex, and play freely. The shoulders at a proper distance from each other, indispensable to respiration, and the proper exercise of the cardiac functions. Respiration free, with out impediment or cough, voice natural, and sound unimpaired.

About the abdomen there should be no sign of visceral or chronic disease; tympanites, dropsy, or hernia, or even the predisposition incompatible with pulling, hawling, or duties aloft.

Genital organs normal. There ought to be here no dropsy, fistula, or enlargement, varicose or schirrous.

The limbs, particularly the legs, round, well-formed, clear of ulcer, scar, and every enlargement, varicose or fleshy, which are incompatible with locomotion or the duties of a seaman. In young robust men, if otherwise serviceable, recent small scars on the shin may be occasionally passed over, but old or frequently repeated cases, with the original structure repeatedly and thoroughly broken up, to be objected to.

In the examination of seamen, regard must be had to strength. The power or strength of a crew must necessarily correspond with the size of the ship or her weight of metal. In most, the blue jackets of the present day are too light, or too much under-sized, and which comports badly in many with the heavier metal now in use. The marines, as a body, in general are more powerful or more robust than the sailors, and form often the prop or main-stay of the ship's company,—the pulling, hawling, working body.

Examinations of the nature herein referred to are necessarily private, and must necessarily be conducted with care and equity. They are strictly medical, that is, independent of every other circumstance, the point alone to be considered being the fitness or the unfitness of the individual in question for the sea service. On such occasions nothing, it is almost unnecessary to say, can be received verbally, only what may result from a personal survey. On this duty, and the manner in which it is carried into execution, much will depend.

CHAPTER II.

MEDICAL SURVEYS.

The collective constitution of a ship's company is, in a great measure, artificial, and varies in different ships, and in the same, at different times. The state of the ship will be happy, healthy, and comfortable, or the reverse, discordant and disagreeable, according to the nature of the primary ingredients of which it is composed, or the agencies applied. The general constitution, that is, the constitution of the crew, taken as a whole, is plastic, or capable of moulding. Within this circle, two bodies acting and reacting exist distinct, but on each other dependent—the active or governing, the passive or governed—the one the active to all, gives form and force, the other the passive, the mass or body acted on, or through which the first operates. On the due balance of these two bodies, or their co-operation, much will depend in the character, efficiency, and health.

The ship in which these two bodies, or the officers and men, best co-operate or pull together, will always be the most happy, healthy, and comfortable, and, what is of most consequence, the most efficient.

Amalgamation, or the working together into one homogeneous mixture or mass, different natures or dispositions in a new ship's company, is at all times the work of time, temper, and talent, of a thorough knowledge of human nature, and of that, practically applied. In some, amalgamation is quickly effected, in others more slowly. In some it is smooth, or comparatively with ease accomplished, in others much more difficult, or, through the inexperience or want of tact in the officers, or the intractability of the men, never effected. In all masses of men amalgamation is indispensable, for union, strength, and safety. In some ships, during the first, or at farthest during the second year, through a uniformity of character or feeling existing, amalgamation takes place, forming a happy, healthy, powerful body, in others, from a general disunion or intractability, later or never.

With every possible degree of care, cases of disease for scurvy will creep into all ships, and into crews even the most cautiously selected, arising from the natural obscurity of chronic disease or concealment, and which cannot easily be detected.

Cases of disease for survey are always occurring in ships of war, but in every one varying, and both as to number and kind. The frequency of such will vary with the youth and stamina of the crew, with the care taken in their first selection, the one being generally the inverse of the other, and with the period of the commission, the season, and climate.

During the first year cases of disease for survey are always most frequent, during the second less, and during the third and fourth least of all. Disease or its germ, which was latent previous to entering the service, becoming after,—through change of diet, habit, or climate,—excited, morbid association and action resulting.

Assimilation to the habits and living of seamen is, at all times, gradual, and at all times, more or less, in progress, during the first year partially effected, during the second more fully, and during the third and fourth more completely.

Among a body of men who are young, robust, and bred up from infancy to a sea-life, cases of disease for survey, from assimilating causes, will, in all probability, seldom occur, and not more the first than the third year. On the contrary, in crews that are young, and unused to a sea-life, or in those who are old, or worn out, cases of disease for survey, will undoubtedly be much more frequent, in the first, from excitement or non-assimilation, in the last from frailty.

The number or frequency of cases for survey will at all times vary with the care taken in their first selection. If, in raising a crew or manning, any or every one who may present is taken, and without that care or discrimination, which in all such cases is so indispensable, raw hands, old men, people unused to the sea, the number, and with that the character of the ship, may soon be made up, and a body of men formed, powerless and inefficient, abounding in sick, and in cases for survey.

The medical examination at first, and the survey after, are naturally counterparts or parts of the same duty, but controlling each other. By the one, all those who are unfit, will be, or ought to be, rejected or objected to, and by the other, those will be got rid of who may have escaped the first. The more closely, therefore, the first or the examination is conducted, the less necessary and frequent will be the second or the survey. In both the object in view is the same, to select the serviceable, and reject those who are unfit; only that, of the two modes of procedure, the first is the more simple, the second the more complicated.

Subjects more immediately calling for a medical survey are chronic cases of disease, cases that may be lingering, and such as may be incurable or doubtful. Diseases are curable at a proximate or distant period, or they are not. Acute disease is not generally embraced within the limits of a medical survey, such terminating too speedily in health or dissolution.

In a sea-going ship, the duties necessarily incurred are active, urgent, and, under any circumstances, must be performed. In all ships there must and will be sick, cases of disease, both acute and chronic. The strength of the ship, and the length of the sick list are naturally inverse, or the longer the latter, the weaker and more crippled must be the former.

In acute cases of disease, there is always some prospect of a termination, either in the return of the patient to health, or dissolution. In chronic cases it is otherwise. In them the termination may be distant or doubtful, or there may be no prospect whatever.

In a sea-going ship the duties are active, important, and must be performed, and either by the parties themselves whose duty it is to perform them, or by some others, when necessary, in their stead. In all cases, the length of time for absence from duty must have a limit, and will necessarily vary with the nature of the disease, the probability or improbability of a cure, and the nature of the duties required.

Some cases brought forward for survey, as phthisis, paralysis, or dropsy, are clear, or at once made out, and no delay necessary. Others, as rheumatic, hepatic, dyspeptic cases, are less obvious, or more obscure or doubtful, and more time or consideration required. In sea-going ships, however, to absence from duty there must be a limit. Here all duty is important, imperative, and, by some one or other, must be performed. If a case, whatever that may be, should still be lingering and doubtful, and, notwithstanding all the remedies that may have been employed, at the end of six weeks or two months, and particularly in an individual known to be of a thorough bad character or constitution, it may be considered then a fair one for survey.

Officers are more wanted, and more important than men—their duties more urgent and more responsible, therefore can be less spared—and an earlier decision, therefore, in their case must be come to, but resting always on the nature of the case and duty; for instance, farther trial of what may be done, or a longer probationary period, may be granted to a marine officer or chaplain, whose duties are not so urgent or onerous, provided the case is doubtful or not incurable, than could be reasonably allotted to an executive officer, purser, or surgeon, whose duties are more urgent, more personal, and must be performed. In most, however, six weeks or two months may be considered a fair period, for the trial of remedies. In some way or other, during this period, the character of the case, or that of the individual, will be drawn out, or what may be done for his cure. If, at the expiration of six weeks, or two months, the case, whatever it may be, and, notwithstanding the use of means, should still continue without the prospect of a cure, it would be wrong then to defer a survey longer—an injustice to the patient and the ship.

Diseases are curable, or they are not; they are functional or structural, that is, they consist in morbid action only, or that with change of structure. The first, by far the most simple and numerous, are sometimes protracted, but generally curable, and always take precedence of the other. The last, by far the most complicated and tedious, are often incurable or fatal. The consequence of diseased action, however, where or when induced, if sustained long and strong enough, is change of structure. Functional disease is generally curable, but if protracted, may become structural, or the object of a survey. Structural, and the bulk of chronic cases, are incurable, or objects for survey.

A medical survey may be plain, or it may be exceedingly difficult. In phthisis, paralysis, hernia, and such like, there is commonly no difficulty, but rheumatic, hepatic, chronic cases, are often difficult to unravel or tangibly detect.

In a clear case, where the disease is obvious, the officers surveying may at once, from the appearances before them, decide, but in a doubtful chronic neuralgic one, the business in general is much more difficult and complicated. Symptoms then are not so prominent, striking, or characteristic. To unravel or make out tangibly, the character of the case, or the man, circumstances and symptoms, in all their bearings, must then be considered.

If the man, the object of survey, is damaged in his character, and on this much will in all such cases depend, if dissipated, quarrelsome, or, whenever he can, a skulker, or if the evidences of disease are not so tangibly developed, as to make the case clear, and all should depend on his own statement, the case then may be considered doubtful or suspicious, and may be prudently, if it is desirable, deferred ; but on the worth of the man, and his previous character, much will depend.

If the man should be useless, discreditable, or old, his discharge from the ship may be desirable, but if young, of a previous good character, and an acquisition, the disease being at the same time doubtful, more time may be given. Something more of the nature of the case or the man may be drawn out, or the disease yield.

Disease may be real, or it may be feigned. Cases of both occur among seamen, but which time and observation together will in most solve.

In naval medical surveys there are always one of two objects in view,—entire removal from the service, or change of climate, and to both surveys abroad refer. On foreign stations cases of disease for survey are of two kinds, the one considered curable by change of climate, the other incurable. In the first are included all cases of functional disease, in the other, those involving morbid deposit or change of structure.

On some constitutions climate acts severely. In young, sensitive, and unseasoned subjects, or new comers, through the influence of climate, excitement in the latent constitutional germ is induced, and with that morbid action. In men of moderate habits, and used to a sea life, the influence of climate is always least felt, or by them best resisted.

Disease, at first, is actional or functional, and whatever the cause may be, and first in the nervous, then in the vascular system. This period, the functional, it is to be remarked, is the one proper for the use of means, or change of climate. If the disease, through time and climate together, should have become structural, then a change of climate may, in some forms, palliate, but will, in all probability, conduce little towards a radical cure. This functional or curable period will necessarily, in different individuals, vary with the nature of the constitution, the disease, the climate, age, and treatment.

In violent forms of tropical fever, inflammatory or congested, the functional or curative stage is generally short. In hepatic, neuralgic, or moderate febrile cases, more protracted. In all, it is desirable that this stage, while the disease is still curable, should be seized, and all obviated by timely change of climate.

By tedious passages during tempestuous weather, or winter, by irregularities, or by the want of that dry, warm clothing or accommodation, which is in all such indispensable, cases that were doubtful, or only functional abroad, have, at home, or by the time they have reached it, become structural or incurable,—time and circumstances together, having rivetted at home, or by the time they have reached there, what was curable or only doubtful abroad.

For all cases of disease on foreign stations, fit objects for survey, and whether curable or incurable, a change of climate is indispensable. Cases of disease at home, objects for survey, are either serviceable or unserviceable, that is, they are either functional only, and curable by medical treatment, or structural, and unserviceable.

Medical surveys are strictly medical. Within their limits disease, or the state of health, is comprised, and nothing more. With character, or professional ability, strictly speaking, they have nothing to do, although always bearing more or less on the case or the decision. The officers of a medical survey have to decide on disease, its nature, present state, and the probability or improbability of a cure. In medical surveys, one rule, or principle of acting, is to be applied to all equally,—to officers and men. There is here no respect of persons, —their fitness or unfitness for duty is to be considered and to be decided on. In cases of doubt, where the disease is not clearly made out, the possibility of imposition or skulking—too common among sailors—is always to be held in view, and, when necessary, acted on.

CHAPTER III.

PART II.—PREPARATION FOR BATTLE.

Of all events at sea, on shipboard, battle undoubtedly is supreme. It exceeds all, in the stake at issue, or the end in view. In it is involved all that is dear, and all that is honourable—life, freedom, the fate of a kingdom, or that of the world; Battle, or the strife of contending nations, is, of all subjects, the most serious and solemn, involving, as it does, such mighty objects. It can never be viewed soberly, but with awe, or the most serious contemplation, but must always be prepared for.

Battle, however disagreeable or painful to contemplate, is the aim or object of a ship of war—her duty when called for. It is the test which will infallibly try her. It will try her character, her crew, her discipline; it will try the skill of the most skilful, the valour of the most brave. For such an event all must be prepared, and at all hours and seasons, for come it will, without doubt, in some shape, and at some time, while nations and human nature continue.

The issue of battle is always uncertain. In one the best conducted, or at first most promising, circumstances not foreseen may suddenly arise, or something not expected, to alter the prospect, and which no one can anticipate, but which it is the duty of every man, as far as he can, to prepare for—opportunities never lost sight of by an intelligent enemy—by one who is active and daring.

The scene of conflict may take place during the day; but it may also at night, during the hours of sleep, and suddenly. To a careless, badly-regulated, or lubberly ship, the first intimation of an enemy may be a broad-side, and a proper one it would be. However well a ship may be drilled or manned, it will never be found to be too much, when the hour of battle arrives. For this, every one and thing ought to be prepared—to it, every thing ought to be subservient, to an event of such awe, to one of such mighty importance.

Battle, with its horrors and consequences, is, under any circumstances, and even to the most callous, revolting — the bodies of men dismembered or disembowelled,—appalling though such scenes of blood and carnage may be, yet, through the blindness, prejudices, or passions of nations, become from time to time necessary, if not indispensable.

During battle, the cockpit, or place allotted for one, is the receptacle for all who are unable to go to quarters, or hurt and wounded. Here, during such tragedies, scenes the most awful and thrilling have from time to time, and among all classes and ranks of men, passed. At such a moment, war, said to be the game of kings, may be viewed in her terrors, or what some may be pleased to call, honour and glory.

For a surgical operation, the cockpit, or place allotted for one, is not the most eligible; but, under all circumstances, at the time the best. For the reception and relief of wounded men, much, both in action and previous preparation, becomes necessary. Battle, with its consequences—death, wounds, and the cockpit work, is soon felt. Under any circumstances, and even the best regulated or prepared, duties of the description here referred to are always onerous and trying.

In war, where all is uncertain or sudden, nothing should ever be left to chance. Suddenly, or unexpectedly, or at night, some conflict may take place, but which it is the duty of every person to be prepared for. To a lubberly, careless, or unprepared ship, the first salutation from the enemy may be a broadside, and the cockpit become rapidly filled with wounded men. For emergencies of this nature, every thing, and every one, in a ship of war, ought to be prepared, —there ought to be nothing at such a moment ever wanting, or to be looked for.

The importance, onerous nature, or responsibility of medical duty during battle, can never, by any one, it is imagined, be questioned, embracing, as it does, death and wounds in every shape, limbs lacerated or torn off—wounds from musketry or splinters—bayonet or cutlass wounds, every thing, in short, appalling or horrible, and all, probably, in a few minutes, in the midst of bustle, the noise of guns, a close atmosphere, and what renders all still the more embarrassing, candle-light, and through heat and closeness in tropical climates, still more grievously augmented. In obviating inconveniences about the cockpit, much, however, by a previous, medical, methodical arrangement, may be effected, and both for the comfort and convenience of those wounded, and that of the medical attendants.

In battle, wounds and injuries of every description and degree are met with, slight, serious, and fatal; and all, probably, in a few minutes, or, if the battle should continue, certainly within an hour. The rapidity, uncertainty, extent, variety, and generally serious import of a sea-fight, will indicate sufficiently to most what is likely then to be required or prepared for. Samples, however, taken from ships of the line, frigates, and sloops, exhibiting the duration of the battle, and casualties therefrom resulting, or the number killed and wounded, will probably shew more fully and forcibly than any words, the necessity of previous preparation.

SHIPS OF THE LINE.

June 1*st*, 1794.—The Queen Charlotte, a three-decked ship, Admiral Lord Howe, at 9–52, A. M., after being for some time successively fired on by various ships in the French line, on her way down to take up her proper position, engaged in the most gallant and determined manner, and, within pistol shot, the French Admiral Villaret, in the three-decked ship, Montagne, at 10–10, that is, in eighteen minutes only, from the commencement, the Montagne dreadfully shattered, from the heavy, rapid, close, and well-directed, double and triple shotted broadsides of the Queen Charlotte, bore up with what sail she could set, and hastened out of the line. During this space, that is, in about eighteen or twenty minutes, the numbers killed and wounded on board this French ship were: killed 100, wounded 200,—a sample of the old school gunnery.

August 1st, 1798.—The Zealous, 74, Captain Sir Samuel Hood, one of the leading ships of Lord Nelson's fleet at the battle of the Nile. At about 6 P. M. the Zealous, with the Guerrier, the headmost ship in the French line, commenced a furious, and, on the part of the British ship, a well-conducted action. In about five minutes from the commencement, the foremast of the French ship went by the board, and in about ten more the other two; and about 9, when from stem to stern a perfect wreck, struck. During this period, or from 6 to 9, there were killed and wounded on board this French ship, from 350 to 400 men.

FRIGATES.

March 1st 1799.—Between the British eighteen-pounder frigate, Sybille, Captain Edward Cooke, and French twenty-four-pounder, Forte, an action was fought in the East Indies. At 12–45, or a little after midnight, the action commenced, and at 2–30, or after the battle had raged with the most determined fury on both sides, but particularly on that of the Sybille, for 1 hour and 45 minutes, the French ship struck. On board the Sybille, out of 370, killed 5, among whom was her gallant captain, wounded 17. Forte, out of 370, killed 65, wounded 80—a striking disparity in the execution effected by the batteries of the two ships, and the more so, the ship that effected most being an eighteen, the other a twenty-four-pounder,—another sample, as many have been, creditable to the old school.

June 1*st* 1813.—Between the British eighteen-pounder frigate, Shannon, Captain Philip Broke, and the United States frigate, Chesapeake, same force, an action was fought off the coast of the United States. At 5–50 P. M. the action commenced, and at 6–2, or in twelve minutes only, the American frigate staggered, and, completely routed, was boarded by the Shannon, her brave captain leading, and in three minutes more, or fifteen only from the commencement, carried and taken—the stripes and stars came down to give place to the British Union. On board Shannon, out of 330, in fifteen minutes killed 24, wounded 59; total 83. Chesapeake, out of 386, killed 47, wounded 99, total 146, or, according to the surgeon's report, 160 or 170. The result of this action places in a strong light what is intended throughout this chapter to be inculcated, the imperious necessity of every thing in a ship of war relative to wounded men, being at all times ready for immediate service—an example worthy of imitation throughout all succeeding ages.

SLOOPS.

August 14*th* 1813.—Between the British sloop of war, Pelican, and American sloop, Argus, same force, an action took place in the British Channel. At 6 A. M. the action commenced, and at 6–45, or in forty-five minutes, the American sloop struck. Pelican, out of 113, killed 2, wounded 5. Argus 125, killed 6, wounded 18.

April 29*th* 1814.—Between the British sloop, Epervier, and American sloop, Peacock, an action was fought in the West Indies. At 10 A. M. it commenced, and at about 11–5, or one hour and five minutes, Epervier struck. Epervier, out of 117, killed 8, wounded 15. Peacock, out of 185—a very great disparity between the number of combatants in the two sloops—killed none, wounded 2—a sorry sample this of British gunnery, but one out of rather too many of the same description, which, it is painful to say, about this time disgraced the British navy.

In the foregoing details, samples are given of different actions, of their duration, and the casualties therefrom resulting, in different classes of ships. Circumstances of this nature call for, it is obvious, most pressingly and imperiously, previous preparation, or an arrangement previously of every thing wanted for wounded men, or for performing whatever operation may be then necessary properly and professionally.

For convenience and the sake of the wounded, wounds or injuries may be divided into three kinds, slight, serious, and fatal. Slight injuries. During the press or bustle of action, where cases are numerous and urgent, or pressing, wounds or injuries of a slight nature, or that involve no danger, may then with propriety be put off. It would be unreasonable or unjust to trifle away time at such a moment with cases of no importance in the face of others more urgent or pressing, or that cannot be deferred.

Serious injuries.—Wounds or injuries that, from their extent or position, involve danger, are always imperative, or call for immediate attention—limbs lacerated or torn off, hæmorrhage, fracture, burn, are all more urgent than the slight, and not like the fatal, hopeless.

Fatal injuries.—In fatal cases—the pelvis shattered, or body pierced through, and the man dying, it would be useless or unjust to delay or put off time in the presence of others as urgent and pressing, but not without hope. In injuries of a fatal nature nothing can be done. Palliation only can be administered, a stimulus, an opiate, a proper easy position.

Of all symptoms presented to the surgeon in action, the most urgent, alarming, and indubitably most formidable, is hæmorrhage. To a serious bleeding every thing must of necessity at once give way, and the vessel be secured. A general or superficial oozing of blood from a wounded surface may not be, among a number of others, more urgent, immediately pressing, but bleeding from a wounded artery will at once demand aid.

Wounds or injuries differ in degree. Some are urgent, craving immediate attention, and some may be deferred. For some an operation is indispensable, or immediately necessary; in others, it may be delayed, or doubtful.

Nervous concussion, or derangement, marked by sinking of the pulse, cold sweats, and syncope, is often simultaneous with, or immediately consequent to, severe or extensive gun-shot injuries. If such is nervous only, and does not depend on hæmorrhage, in all probability it will be transient and pass off. If from the loss of blood, the case then will be different, and probably lasting and fatal.

In gun-shot, or other injuries, where an operation may be deemed indispensable—a limb shattered, lacerated, or torn away, it should be immediately, or as soon as it can be, performed. Nothing can be gained in such a case by delay, but, through irritation, and the certain prospective of a painful operation, much lost.

If a case should be hopeless, or the man apparently dying, an operation then would be useless; but if a doubt should remain as to the hopelessness or fatality of the case, and a chance of escape, through an operation, should appear, this chance then the man should have, if he is willing. By a separation from ragged muscles and bones, whatever the issue may be, he cannot lose. If syncope, or sinking, be dependent on nervous derangement, by an operation the system may rally. If loss of blood be the cause, here even, by an operation, he could not much lose.

Cases of the nature herein detailed are never trivial, nor the duties consequent thereto, it is easy to see, trifling. Under any circumstances, and even the most advantageous, exertions, the most energetic on the part of the surgeon will, it is obvious, be called for, and with a determination on his part never to be, by any circumstance or thing, shaken. The requisites for a naval surgeon are,—a good eye, a steady hand, and, above all, a good constitution; a capability of undergoing any privation, any climate, any weather, or any fatigue, and operating by candle-light.

For various purposes, surgical, and useful in action, it will be seen, from what has been said, that previous medical methodical arrangement of every thing necessary, or relative to wounded men, becomes necessary, or rather cannot be dispensed with.

Amputation table.—In ships of the line, and all that have the convenience for one, this is indispensable. It is, or ought to be, the surgical depot. Filled and fitted with every thing necessary for wounded men, it is, in action, eminently serviceable; but, to be so, must be large enough to accommodate with ease several men,—ten to twelve feet long by six or seven broad. Drawers in the amputation table for instruments, and such other necessary articles, are also indispensable. In these nothing, under any circumstance, should ever be lodged but what relates to wounded men, that, however sudden or unexpected any action may take place, there may be neither delay nor difficulty, nothing wanting or to be sought for. In every well prepared ship or cockpit, the drawers should be labelled, that, night or day, or at whatever time a battle may occur, their contents may be seen at a glance. Suppose two rows of two drawers each on each side the table, the upper one and aftermost starboard would be No. 1. Surgeon's instruments, next forward, No. 2. first Assistant-surgeon's instruments.

Aftermost second row, No. 3. second assistant-surgeon's instruments; next forward, No. 4. tourniquets. Uppermost and aftermost port side, No. 5. calico, flannel; next forward, No. 6. bandages; next aftermost below, No. 7. sponge, plaster; No. 8. sundries. In this manner, in a limited fixed space, every thing necessary for wounded men would thus be embraced.

Water.—In every cockpit this is indispensable. It should form part of every ship's equipment, necessary at all times for fighting or fire. No ship should ever go to sea, or ever be one day, under any circumstance, without water in the cockpit, and the means of supplying it liberally. Two or more casks filled with water, and fitted with brass cocks, and, to prevent mistake or misconception, labelled with the word Surgeon, or some other word characteristic, should be, at all times, placed by the side of the main-mast, or in some other part of the cockpit convenient or conspicuous.

Light.—In every surgical operation or arrangement, this, like water, becomes indispensable. The cockpit, or place intended for one, from its natural sunk position, and particularly when covered in action, is necessarily dark,—to remedy this is an object, and an important one. Ten or twelve glass lanterns in a ship of the line, and more or fewer, according to the ship's size, should be kept at all times in readiness, and solely for this duty, and hung up labelled by the side of the main-mast, or in some other part of the cock-pit convenient or conspicuous, that, however sudden or unexpected a battle may take place, there may be no delay—no difficulty, nothing to be looked for. Hooks for the lanterns must be all previously placed.

Cots.—In clearing for action, or as soon after as may be convenient, cots, with every thing necessary, must be hung up in the cockpit, and tiers, for the officers or men who may be badly wounded.

An inspection of sick cots is always highly necessary. When first received from the dockyard or other naval depot, cots seldom fit, some being too large, some too small for the frames, and some will not fit any way,—this must be looked to. When first received, therefore, an inspection should immediately take place, and then, if necessary, the different parts cleaned, fitted, and numbered, and both the different cots and different parts of the same, then laid aside for service. Ship's cots are generally too large or bulky, and too inconvenient for service. In all ships this is, to say the least, disadvantageous, but particularly so in the small, where space is an object; and in place of being stitched at the sides, as they usually are, ought to be laced, that at any moment, or for any purpose, they may be undone.

Tourniquets.—The number of these must, of necessity, correspond to the ship's size. Two kinds of tourniquets are commonly in use in action, the wooden or temporary, and the brass. On the sufficiency of these, with their belts and buckles, much may depend. Tourniquets should never be received and taken on charge from any depot without an inspection, without full and satisfactory assurance of their efficiency. Brass tourniquets are too complicated, and not numerous enough on shipboard, for the use of seamen. They are intended and more suited for the surgeon; those of wood, or what are called field tourniquets, are the more adapted for distribution. The most simple, and perhaps the most serviceable of these, is a wooden roller placed on a wooden stuffed pad, with a strong strap to tie and twist under and about the limb. When large vessels are cut through by a cutlass or gun-shot wound, the flow of blood, in general, is too great or impetuous to admit of delay. If assistance is not ready and immediate, life is soon terminated. The number of tourniquets required for such purposes, must necessarily correspond with that of the crew, but, in general, will be about three or four to each gun, and about as many to each top. In procuring these to any amount or number, no difficulty, it is presumed, can ever be encountered, at least none ought to be in ships of war, where tailors and carpenters in such numbers abound. Whenever, therefore, a ship clears for action, tourniquets, and in number sufficient, are then to be served out to the captains of tops, and captains of guns, and placed in their charge; but all, of course, previously instructed in their use and mode of application.

Platforms.—In preparing to meet an enemy, these, of sufficient size and number, are then to be erected. For this purpose, no place can be better calculated than the tiers of a line of battle ship, and particularly now chain cables are in use. In this way the cockpit will be cleared of wounded men, and the lower deck of stools and tables, a point of some importance. While the ship is clearing for action, therefore, men in sufficient number are then to be stationed at the fore and main hatchways, to hand or take down whatever may be necessary for clearing the decks or raising a platform,—mess-tables, stools, whatever may be unnecessary, cumbersome, or in the way of the guns.

Topslings.—Whenever an action becomes probable, these must be placed in the different tops, that all that may be wounded may be at once sent down. Men wounded aloft about the tops or rigging, become immediately not only helpless to themselves, but an obstruction or hindrance to those about them. All, therefore, who may be hurt, should be at once sent down, and both for their own good, and that of those about them. Topslings may be made either of canvass or rope, but of whatever they may be, must be always both strong enough and large enough to support and envelop the body fully. For sending down men wounded in action from other parts of the ship, cots with purchases rove, and all other necessary accompaniments, are also to be placed in the different hatchways.

Buckets, Swabs.— These also, for all such cockpit duty, become indispensable. Their number must, of necessity, correspond to the ship's size, and to be kept hung up in readiness, and labelled, in some convenient part of the cockpit.

Sand.—A drawer filled with this is also necessary, for sprinkling and drying the deck, and other purposes. It gives stability or firmness to the footing, particularly in a sea way, and facilitates not a little the movements or work of the medical attendant.

Sick-Bay.—When the ship clears for action, this, like every other part, must also be cleared. The bottle frame, with its contents, must then be removed, or if time will not admit of this, shut up. This and every thing appertaining thereto, ought to be portable, capable at a moment of removal. Incalculable mischief, it is easy to see, may be inflicted in a very short time, through the fragments of glass bottles flying about, or the aspersion of corrosive burning fluids.

Boat-service.—Medical duty in boats, in ships of war, is by no means unfrequent. In sea-going, and in every ship, this must be prepared for. A boat expedition is always in its nature very uncertain, both as to the distance to be gone, the success and return, all depending on winds, weather, locality, and on the skill and character of the officer commanding. Men, for this duty, ought to be warmly and thickly clothed, fortified against chances of every kind, whether arising from fighting or the weather. For withstanding the weather or wet, and stowing most conveniently in a boat, a common wooden box, covered with canvass, and painted, with a suitable shoulder strap, will be found, on all occasions, the article best suited. In this manner, every thing necessary for wounded men will be presented compactly and at once; In the upper lift out, may be deposited an amputating knife, scalpels, tenaculums, an artery forceps, bullet forceps, a saw, lancets, needles, ligatures, thread; in the lower, tourniquets, bandages, plaster, wax, sponge, lint, scammony, morphia, mustard, opium, jalap, calomel, salts, powders, pills.

On the importance of all matters, contained in these and the following pages, and however imperfectly treated, it seems unnecessary to dwell. It must be obvious to the most superficial observer, to the merest tyro, to every one at least, acquainted in the slightest degree with the nature and duties of a ship of war—health is power, without it, no ship and no fleet can be efficient; and what are ships, what are fleets, it may be here asked, in sober reason, without efficiency? what are ships, built after the most approved models, guns cast on the most improved calibre, without efficient men, with men laid up with fever or scurvy, as in former days they used to be, without men in health, without men able to work and fight them? — let he who can answer tell. It is the bravery of her seamen, not the model of her ships, for they seem to have sailed as fast formerly as now, that has made Great Britain what she now is. And what, or where is bravery,—it is here repeated, without health? they are coexistent and inseparable; no man can be brave who is laid on a sick bed,—hence the importance of the subject at present under discussion. It is the bravery, and, consequently, the health of her seamen, it is here contended,—and let he deny it who can,—that has made Great Britain what she now is, that has made her flag brave for a thousand years the battle and the breeze, and makes her now ride Queen among the nations.

CHAPTER IV.

PART III.—PROPHYLAXIS.

PROPHYLAXIS, or that branch of medical science which investigates the causes of disease, and the various modes of evading or counteracting them, must be to all interesting. In every situation, the knowledge of the cause of disease, and of the means or mode to counteract or crush it, must be important, but particularly so among multitudes, or dense bodies of men, as in ships of war or barracks.

Men in masses are always more prone to disease, and to its virulence, than when isolated, detached, or spread. As primary surpass in their importance secondary causes, or their effects, so does the knowledge of the cause of disease, and the means to counteract it, surpass in its importance the means curative.

To the naval surgeon, situated as he is, in a dense population, influenced by diet, habit, and climate, and the chances and changes of war, it is not difficult to see the cause of disease must be important.

Circumstances influencing the health, or the efficiency of seamen, are two-fold: first, those relating to the person, cleanliness, clothing, temperance, and provision, its quantity or quality; second, those relative to the ship, cleanliness, dryness, ventilation.

Cleanliness.—For comfort and health this is indispensable. By ablution with water, freely and frequently performed, impurity, or noxious perspired matter is wiped off, the surface cleaned, the pores opened, a healthy perspiration following, the surface, and, with it, the constitution invigorated.

Sailors are naturally or habitually slovenly, washing seldom, unless constrained, and then sparingly, whence originates itch, herpes, excoriation.

Cleanliness in clothing is not less essential to health, than in person. Dirty, damp flannels, or under garments of any description, are always injurious; saturated with moisture, they are seldom warm, become clammy, cold, and disagreeable; and, in place of absorbing what is perspired, irritate, and chill. Clothing, particularly that nearest the skin, ought to be frequently and closely inspected, and changed when necessary. On the cleanliness, dryness, and sufficiency of clothing, much of the comfort, and not a little of the health, of seamen depend.

Bedding.—A clean, dry, well aired bed, with sufficient covering, is always conducive to health; but one damp, dirty, badly ventilated, or spare, injurious. The evils of a damp, dirty, or spare bed, are often both felt and seen among sailors. Among them nothing, in general, is so much neglected as their bed and bedding. If they are permitted, it becomes very often the receptacle of old shoes, old trowsers, or of any, or every thing, they may be desirous to hide. Exposure of the hammock, and every thing therein to the sun and winds, is indispensable, and ought to take place frequently, once a week, or, at farthest, once in two, that odour, moisture, every thing therein disagreeable or deleterious, may be dislodged or destroyed.

Clothing.—From the care taken by Nature in providing the lower animals with a cover suitable to their climate or station, its importance may be inferred. From damp, or insufficient clothing, or clothing not properly adapted to the climate or season, much of the misery, or diseases of seamen, proceed, exposed as they are, and necessarily must be, to weather, winds, and climate. In averting, or curing disease, much may be effected by a covering suitably adapted to the climate or season. Trying to all constitutions, but particularly to the weak or old, are night-watches; the changes of climate from cold to hot, or from hot to cold, but particularly in winter, and those of the weather or season. For all such changes, preparation, or a previous stock of suitable clothing, becomes in all ships indispensable.

Temperance.—Few vices are more ancient, more extensive, or ruinous, than drunkenness, the root of evil, misery, and disease, and to ruin, or a premature grave, has consigned thousands. Among the seamen of every nation the propensity to intoxication is strong, the bane of the profession, the rock on which thousands split. In a profession, girded or beset with so many perils, the danger of drunkenness to all must be manifest. Intemperance among a ship's company is very soon manifested, by their appearance, by that of the ship, by the absence of cleanliness, by that of comfort, by the general prevalence of crime. It is manifested also by the amount of punishment, and the length of the sick list. A drunken or dirty ship, it is here maintained, never was, nor never will be healthy. And what is more, never will be efficient. The amount of punishment, and the length and strength of the sick list will, in most, tell, or form an index, not far from the truth, of the state of the ship, of the state of discipline, of that of organization, of the character of the officers, or that of the crew. On seamen drunkenness acts twofold,—directly, by falls in board, by falls overboard; by the commission of crime, or the general omission of duty; indirectly, by inducing morbid action, fever, hepatitis, dropsy.

Provisions.—The quantity or quality of aliment is intimately connected with health. From the cradle to the last moment of life, absorption, or the taking up or from the organized system, those atoms or particles which have become useless, or inorganic; and deposition, or the laying down in their place, the nutrient particles derived from the food, are incessant. During life three periods are marked, increase, maturation and decay, distinct, successive, but varying with the individual in their extent or duration.

In youth the process of deposition, or building the structure, is active. This, however, has limits, boundaries of size, and symmetry, which cannot be surpassed; which are gradually by nature evolved, and in time perfected. As manhood, or the limits of size, become neared, deposition, or the building process, slackens, or becomes then, by absorption, more nearly balanced. During manhood, or perhaps for twenty or thirty years, absorption and deposition become then more nearly balanced; the body, as to form, size, and symmetry, remaining the same, or nearly in *statu quo*, but varying with the constitutional strength or stamina; but this also has limits, and then comes demolition, or a reversion of all the processes.

Whence comes the material for deposition or building? The two great providers in the living system, for growth and duration, are the stomach for the raw material, and the lungs for its assimilation. On the healthy condition of these, and the quantity or quality of aliment taken in, will depend, in a great measure, growth and duration. The history of famine, of sieges, and particularly that of the British navy, can tell, how much health, how much the constitution, is influenced or undermined by a poor or spare diet,—how many fleets—how many ships crippled, or laid up through fever, or scurvy, useless.

The pabula, from which the animal products, or strength and stamina are derived, are food, drink, and air. For health, or the due sustenance of the body, the supply, or the deposition of matter, must equal the demand, or the absorption. If deposition should be in excess, or more matter, in a given space, should be laid down than what is in the same taken up, then enlargement of the body will follow,—growth, as in youth, or obesity, as in manhood. If the supply of aliment, or deposition, should only equal the demand, or the waste, then health and manhood may be maintained intact, if nothing interpose, for twenty, thirty, or more years. If, on the contrary, the supply of aliment should not equal the demand, or the waste, or absorption should be in excess, as has been the case among sailors, through scantiness or poorness of diet, times and ways without number, the consequences then, and that in no long time, will be, feebleness, emaciation, a serous state of the blood, scurvy, typhus, ulcers, painful, bloody, rapidly ulcerating.

Chyle, or the fluid derived from the aliment, and holding in solution gluten and albumen in variable proportions, is the fluid to the waste or wants of the body suited. If bread, beef, pork, and cocoa, the standing part of a seaman's diet, should not contain sufficient of these, or should not impart sufficient of these to the blood, to make up for, or replace what has been taken up or away, the consequence of inanition, and that in no long time, will then indubitably follow, —typhus, ulcer, scurvy.

The basis of animal matter is nitrogen. Aliment, to be nutritive or reparative, must, of necessity, in some form contain this. If, through deterioration in the quality or quantity, aliment should be deficient, and immaterial which, demolition, or dissolution, in some shape will then certainly follow. Through the lungs, according to some, oxygen is imparted ; through the stomach, nitrogen, carbon, oxygen, and hydrogen. If the seaman's diet then, should not contain sufficient of these, in some form, to repair or sustain the waste, or demands of the body, continually in progress, inanition, and that rapidly and without fail, will then follow, and with it, typhus, ulcer, scurvy.

By salt, climate, and keeping, the nutritive principles, or the gluten and albumen of meat and bread become decomposed, new combinations and new bodies forming, solid, fluid, and gaseous, with a diminution in the volume, as well as the quality of the article. Beef loses most, pork much less, by keeping, the nutritive or gelatinous albuminous fibrinous principles of the meat being decomposed, forming with the salt, and with each other, compounds soluble or insoluble, leaving in meat, long kept or long salted, little remaining, save a carneous mass, indigestible, innutritious, and dry.

Through confinement and heat, bread deteriorates. Without moisture and without heat, and without the two combined, no decomposition in the atoms of matter can take place. If to these confinement be added, then assuredly, in the elements of the bread, decomposition will follow, with a diminution in its bulk and value—becoming light, friable, honey-combed, crumbling to pieces under the fingers, and abounding in weevils and maggots. The cause of these movements in the elements of bread and meat, is innate, and, under certain circumstances, inevitable, being the law, tendency, or principle, which all compound bodies have to return to their first or original principles.

Water.—Throughout nature, nothing is more diffused or necessary. Water, in the form of rain, clothes the fields, forms the clouds, and makes up the entire body of the ocean. It enters into our wants, comforts, and enjoyments—is the chief part of our diet. On fluidity depend absorption, deposition, and generally organic action. Its consumption in the living system, is always relative and always varying. To seamen and all who traverse the ocean it is invaluable.

Water is a general and powerful solvent, few bodies in nature can resist it. In all parts of the world, mineral bodies and vegetable extractive matter, in large quantities, are taken up, but varying in kind and degree. In high latitudes, and mountainous districts, it is generally most pure, but there even holds always something in solution ferruginous or calcareous. In low latitudes and flats, as in the swampy regions of the Amazon, vegetable extractive matter, in immense volume, is taken up. In broad flowing rivers, water is generally more pure than in streams tortuous or sluggish. Health is dependent on the quality and quantity of water. Its consumption in the living system is always considerable, but always varying. It is the basis of the animal fluids, the solvent of matter. To all it gives life and motion. In different individuals, and in the same at different times, the consumption of water varies, some requiring more, some less. It varies with the climate, more being required in a warm and less in a cold, and with the circumstances, more being required under digestion, exertion, or exercise, than when at rest,—the quantity taken in being always relative or proportional to that expended, or to the quantity in whatever shape given out.

Water may be kept at sea in tank or cask, the first is preferable. In cask the aroma, and with that the bitter principle of the wood, is often extracted, particularly in those that are new, imparting to it a taste and odour by no means agreeable. By the closeness also, decomposition in the animal matter, and with which some water abounds, is often accelerated. No time, and no temperature has any effect on tank water, a point to seamen, particularly in distant or long extended cruises, of very great importance.

By air and moisture iron is acted on, forming the red rust or subcarbonate, which falls to the bottom, but which is insoluble in water, and therefore harmless. As a protector or shield to the iron of the tank, white-washing the inside has been adopted, this, however, is hazardous. Lime thoroughly carbonized is insoluble, but carbonized imperfectly, not only soluble in water, but detrimental. The safest, the most durable, perhaps the most economical of all lining for tanks is tin,—one of the most malleable, flexible, and fusible of the metals, and on which water at no temperature or time acts.

Circumstances relative to the ship, influencing the health of seamen, are, cleanliness, dryness, ventilation.

Cleanliness.—The clean state of a ship's interior is, it may be easily conceived, conducive to health and comfort. By it all movements, chemical or putrefactive, are obviated, or when begun, arrested. In all situations of life this is necessary, but particularly so in a ship, where corners and crevices, and men in masses abound.

The agents by which decomposition in the atoms of matter is instituted, or there carried on, are heat and moisture, through these, changes take place, and new bodies form, solid, fluid, or gaseous, and simple, or compound, but invested with distinct properties, or these proper or peculiar to themselves—active, passive, or virulent. Without heat, and without moisture, and the two combined, no decomposition in the substance or atoms of matter can take place—with cold, or with dryness, it is incompatible. The sources or agents of effluvia, malaria, or noxious exhalation, are heat, moisture, and matter,—the two first, the agents, the last the body acted on.

For the accumulation and decomposition of matter, few places are more favourable or fitted than a ship's interior, divided, or partitioned off, as it is, and necessarily must be, into numberless apartments, hidden, shut and stagnant. In a temperate and cold climate, the want of cleanliness, discipline, or organization, may be for a time, as it often is, harmless, or without any thing morbid immediately resulting; but send a ship of this description to a warm one, the East Indies, or Coast of Africa, for instance, and then observe her,—matter, heretofore quiescent, would then, through heat and moisture, begin to act, or to assume, in some form, life, and new bodies, with new properties, be evolved, with disease.

Fever, or disease in any other form, may prevail in a ship, sporadically or diffused. In the former, it may, and generally does, proceed from something distinct or contingent, the weather, or climate. In the last, from causes endemic or epidemic; the atmosphere, soil, or ship's interior. If a whole fleet is equally and simultaneously attacked with fever, or with disease in any other form, the same in symptoms and character, and without any local cause obvious or distinct, or that can be clearly made out, that the cause, whatever its nature may be, is epidemic, there can remain little doubt. The cause, like the disease, must be general, or spread, or atmospheric. If the attack is more limited, or confined to a ship or two only, in the fleet, while all the rest are healthy, it is clear that this case differs essentially from the other, or that the cause, like the disease, is not spread, or not atmospheric, but local or limited—the result of dissipation, want of cleanliness, or ventilation.

Fever, or other disease, may be limited or confined to one or two ships only, issuing, not from the interior, but indigenous, that is, arising from locality or sources in the neighbourhood. In this instance, however, the disease will be limited, not only, as in the preceding, to the ship, but also to the individuals exposed to the virus or night air. It will be limited to the locality, and not lasting, or not spreading.

In all ships, cleanliness, or the removal of every thing damp or dirty, from the holds, or deep and dark recesses, is of most essential importance, but particularly in tropical climates. In every disease among numbers, or spread through a ship's company, it is of the most vital importance to know, in the first place, the cause, and the means to suppress it; or to know whether the disease is local or atmospheric. If the former, the cause, whatever it may be, must be sought out, and when found, destroyed.

In masses of men, as in ships and barracks, diffused disease, from whatever cause, from its natural tendency to spread, and virulence, is always alarming. If the cause, whatever its nature may be, should be found out to be local, or that the disease exists in no other ship or place, the sooner the ship is cleared out and cleaned the better—every thing then within her, from the keelson, and not excepting the limbers upwards, must be turned out, washed, whitewashed, aired, and dried. On the measures adopted, and the manner or vigour with which these are carried into execution, will, in a great measure depend, in all such cases, both the character of the disease and its continuance.

By clearing out annually, or, as often as the public service will allow, the whole interior of the ship, from the keelson or limbers, (by far the most important part) upwards, much good indubitably, but particularly in a tropical climate, may be derived, and many, if not all, of those frightful cases of fatal fever, so frequent in foreign, but particularly tropical stations, as was instanced lately in the Eclair steam sloop, moderated, if not obviated. By clearing and cleaning the interior, the deposition of matter will be prevented, and with that, its decomposition and germination.

Dryness.--In all ships dryness is beneficial—in them a fixed principle. However dirty, or accumulative a ship or place may be, still, without moisture, no chemical movement or decomposition in the atoms of matter can take place. Moisture is the medium through which caloric in this, acts, or by which decomposition in the substance, or atoms of bodies, is instituted and carried on.

In the open decks of line of battle ships, frigates, and sloops, and in warm or temperate weather, of all methods of cleaning, washing is best. In high latitudes, or cold weather, however, and particularly in close covered places, the case is different—damp or unwholesome effluvia would then be created, and with that rheumatism or fever. In covered close places, and particularly in winter, dry cleaning becomes indispensable—scraping, dry rubbing, hot water and stoves, and, where practicable, as in cabins or cockpits, waxcloth.

A stagnant confined atmosphere is always damp. To be dry and wholesome, it must be circulating and unobstructed—important in all crowded places, as in ships of war or barracks. Much, and it is not easy to say how much, in the way of health may in such places depend on dryness, cleanliness, and ventilation. On these, much, or, it may be said every thing, in the life of a sailor depends, his comfort, health, and happiness. The lower deck or cabin is his house—his home—his all—there he lives, sleeps, spends his life—and there all his pleasures, comforts, and enjoyments, if he has any, are centred. It is his house—his home.

Ventilation.—On the free or unrestricted circulation of air, much depends. To life, air is indispensable—a perpetual aliment. It enters, and permeates the system, and every function or operation, and action in the living system influences. Health is carried in its purity, disease or death in its corruption. Stagnant or damp air, is septic, but the circulating or free a corrector of putridity. Every thing gaseous or pestilent, is received into the circumambient air, and in it diluted or destroyed. Health and comfort are materially influenced by changes in the atmosphere, by changes in its density, electricity, and thermometric or humid state. The purity of the atmosphere is remarkable—from the first to the last moment of our existence, we breathe in it, we consume it. From all parts on the earth's surface, gases, noxious, or pestilent, and in immense volumes, are effused, and without intermission, yet it continues, notwithstanding, at all times, and all places, fit for life, and the purposes of nature. Of all aeriform bodies, it is the most antesептic, and of all, the recipient and solvent. In it disappear, the products of swamps, cities, woods, and forests, and of decomposition in all its forms. It is the depot or solvent of all, yet itself remains intact or unimpaired—this is all very remarkable. In a man in health, and under ordinary circumstances, there take place in a minute about 16 or 20 inspirations. At each of these, about 40 cubic inches of atmospheric air are taken in. Every minute, therefore, there will be inspired about 800, every hour about 48,000, and every twenty-four the incredible amount of about 1,152,000 cubic inches. The oxygen of this, in part disappears, but is again expelled in the shape of vapour, and with about an equal volume of carbonic acid.

According to Sir Humphrey Davy, the quantity of oxygen inspired in the minute, by a single person in health, and under ordinary circumstances, is about 32 cubic inches, or in the twenty-four hours, about 46,080, and the carbonic acid exhaled in the same time, about as much, or 40,000. From the quantity of this, a gas so deleterious to health and life, exhaled from one person only in the twenty-four hours, the necessity of ventilation, free and unrestricted, at all times and places, but particularly among bodies of men, as in ships of war, must be to every one manifest.

Air, to be wholesome, must be free, circulating, or unobstructed. In all ships, and even in the most clear and open, air in the interior parts, is at all times more or less obstructed or stagnant. Slowly, or with difficulty, air—in the lower decks of frigates and sloops, and in the cockpits, cabins, and holds of all circulates,—or is there obstructed and stagnant.

For averting or curing disease, ventilation, or an uninterrupted change of aerial atoms, is, at all times and places, indispensable, but more particularly so in a dense population—a ship of war, or barracks. If every man on the lower deck of a line of battle ship, frigate, or sloop, where hundreds sleep and breathe, and particularly in bad weather or calms, with ports and windsails down, consume in the minute, according to Sir Humphrey Davy, about 32 cubic inches of oxygen, and, in the same space, evolve about as much carbon, what, it may be reasonably asked, must be the state of that atmosphere without that interchange of aerial atoms, so necessary to life and respiration? obviously, in the highest degree, pernicious.

The chemical agency of the atmosphere is undoubted. It receives and destroys within it all matters, gaseous or miasmal. If it was not for this disinfecting or dissolving power, with which the atmosphere is so immediately and universally endowed, what then, it is asked, would be the consequence? In the atmosphere, then, morbid accumulations and combinations, incompatible with health and life, would speedily take place, or a revolution fatal to life and nature. Carbonic acid, to the daily amount of about 40,000 cubic inches, issuing incessantly from every human being, and, independent of all other sources, or animated tribes, would speedily accumulate,—effluvia, or noxious exhalations issuing from every part on the earth's surface, would also speedily accumulate, mix, and all concentrated, and every where presented, nature and life would come to a close; but in the surrounding circulating atmosphere, all matters, miasmal or pestilent, are received, and there dissolve or disappear; and all this, it must be repeated, is very remarkable. In secluded spots, ship's holds, or magazines,—places close, confined, and with difficulty ventilated, chlorine nitric, or nitrous acid gases, for the purpose of purification, have been, and with benefit, used.

In open, or sick rooms, however, or places approachable, and with ease ventilated, such airs are unnecessary or uncalled for. To the sick, and to places approachable, or that can be with ease ventilated, not one among them is so safe, so salutary, so well suited, and what is more so, efficacious, as the atmosphere—every thing it surrounds, every thing it permeates, every where it enters, and with gaseous noxious bodies of every description and every source, mixes, and dissolves, or destroys.

In close apartments, ship's decks, or barracks, where numbers live and sleep, a change or renewal of the surface becomes from time to time necessary. By it taint, damp, and every thing adhesive or obnoxious, is taken away, or the place purified.

For this purpose paint is objectionable—a painted surface seldom dries, it is impermeable, or a nonabsorbent. White-wash for this purpose is much more suited. By it, vapour, effluvia, much that is exhaled, is imbibed, and what, in sleeping, or confined apartments, is often so abundant, carbonic acid,—converting what of the lime remains uncarbonized into an insoluble hardened carbonate.

Air, heated, expands, grows lighter, and ascends, its place being supplied by a stream, cooler and denser. On all parts of the earth's surface, this is in progress. In every ship, and every part of one, this, for health and comfort, takes, or must in some degree, take place, though often imperfectly—the heated air expands, becomes lighter, and thereby ascends, floating, although sometimes slowly, towards the hatchways; the velocity varying with that of the counter-current and the distance—quicker in the neighbourhood of the hatchway, and the more tardy as the more remote.

By the windsails or hatchways, the cooler and denser air descends, and by the same, that heated, ascends. In the same passage or area, and at the same time, therefore, there must exist two streams or currents, but moving in opposite directions,—that heated, up—and that cool down,—each striving, as it were, for the mastery; the consequence of all this is, and necessarily must be, an obstruction to ventilation.

The cool air, entering by the hatchway or windsail, through its gravity, descends naturally to the lower parts of the deck, and there circulates, but chiefly about the hatchway—in those parts also which are more remote or crowded, it may also circulate, but very partially or imperfectly. By degrees the air gets heated, expands, grows lighter, and ascends, wending its way, but often slowly or circuitously, through the hammocks, or other obstruction, towards the hatchway. Heated, impure, and in this manner spread out, it is then by columns of air rising, cooler and denser, borne up, and which again in their turn, by others rising still more cool and denser, are also borne up, and by them finally expelled. In this manner a circle of circulation or currents becomes established, but which, from the nature of the parts or structure, are necessarily obstructed or incomplete.

Ventilation, on ship board, may be effected in one of two ways. The one, by windsails, as already described, but which is always imperfect. The other, by scuttles in the ship's side. In the Vanguard, and other line of battle ships, of the more new construction, the latter is the mode, and one more rational, more complete, and, for health and comfort, better adapted than the other. Through one set of apertures, or scuttles, in the ship's side, pure air enters; throughout the interior it circulates, every thing or place permeates; every thing damp, tainted, or impure, purifies and dries; and when heated or impure, by another, or the hatchways, escapes. In this manner, the temperature in the cockpits, tiers, and all within becomes reduced, made more agreeable, and more uniform; the sense of closeness, or heated dampness, so universal, and so disagreeable, in the old close cockpits, is removed, and all made airy, wholesome, dry, and sweet. Air enters by the scuttles or apertures in the ship's side, and, after circulating or whirling about the interior every where, escapes by the windsails or hatchways, consequently there are here no opposing currents, or no obstruction, as in the other mode, to ventilation—the circle of circulation being formed, or in this manner complete.

The object of this, and other chapters, bearing more immediately on the subject here under discussion, is to bring to view, or more prominently to notice, what may appear at first, to those little versed in such matters, as uninteresting, or unimportant, but telling, most immeasurably, at all times, and in all ships, the writer begs to say, on health and efficiency. Health is strength, it cannot be too often repeated, and without it, no ship, and no fleet, can be efficient,—an axiom, incontrovertible, as fixed as the stars, and as enduring and unalterable as the sun and moon. No ship, it may be relied on, will be long healthy, and what is more to the purpose, and more essential to a maritime nation, long efficient, which is not clean, not ventilated, not dry, not temperate in the crew, and in which a system of regularity and propriety has not been established, and in which the crew are not fed and clothed as they ought to be. Drunkenness, the want of cleanliness, the want of clothing suitably adapted to the climate or season, of food calculated to sustain or repair the waste of the body, and of due ventilation, may be looked on as the sources from whence inefficiency, or the crippling, or disabling of ships or fleets, and disease in a thousand forms among seamen issue, and which it is the object of this, and other chapters of a like nature, to find out, and, if possible, obviate; they may be regarded as the sources from whence effluvia, volatile, and virulent, but not infection or contagion, issue, and as the sources of fever, the scourge of tropical climates, ulcer, and scurvy.

CHAPTER V.

PART IV.—PATHOLOGY.—FEBRIS SYNOCHIALIS.

THIS type of fever is frequent among seamen, but varies in form or degree. It is met with in all climates, in all seasons, but most frequently in spring and autumn, and in every rank or age. It is usually the product of cold, somehow, or in some form, applied—during wet tempestuous weather—night-watches, or from clothing or bedding damp or insufficient. In tropical climates, it also occurs, from solar exposure, or from changes in the atmosphere, thermometric or hygrometric. It is usually sporadic, not diffused,—a disease of individuals, not numbers.

Causes predisposing to synochus, are, broken rest, poor, or spare diet, damp clothing, night watches. On the North Sea, Channel, or Mediterranean stations, and particularly in spring or winter, synochus is most frequent. If the crew of a ship should be too light or too feeble, to bear up or undergo hard weather or duty, the consequences then are, and that very soon, inefficiency, long sick lists, rheumatism, fever. Strength, stamina, energy, and enterprise, with the capability of undergoing any privation, or any weather, are all indispensable in an able, active, seaman.

This form of fever is functional or structural. It is usually more obstinate, more violent and complicated than catarrh, and less curable. The termination will vary. In slight or moderate cases, it will be generally favourable, but in neglected, protracted, violent ones, organic and fatal.

Synochus, like other fevers, has a premonitory or initial stage, and of longer or shorter duration—pains, general or wandering over the body, nausea, loss of appetite, pain or weight about the head, stupor, giddiness, sense of coldness, flushes of heat, quickened irregular pulse, tongue and skin dry, oppressed breathing; some or all of these in general, either precede or usher it in. In these symptoms, there is nothing either diagnostic or precise, nothing to denote the nature of the coming disease; they are the preludes or forerunners merely, and common to all the Pyrexiæ. The duration of this, like that of all the other stages, is always uncertain, depending on circumstances, and may be one, or may be several hours.

After some period, but, as already observed, always uncertain, reaction, or the second or diagnostic stage, commences; the pulse, if previously small, then rises, becomes fuller or firmer, varying from 90 to 120; the surface, if previously cold, becomes hot, hard, and dry, and with often a sense of burning, pain, and throbbing about the head increase; pain may be general, or seated exclusively in the temples, orbits, or base, and either acute or dull; tongue, at first dry, becomes white and rough, mouth parched, taste vitiated, bowels constipated, and moved with difficulty, urine scanty, hot, and high coloured. In all, nausea prevails, in some vomiting, a symptom disagreeable at least, if not dangerous.

Like most other forms of fever, this is paroxysmal, an accession taking place in the evening, with a corresponding remission in the morning. Towards afternoon or evening, a sense of coldness in back or limbs, or a disposition to shiver, with thirst and restlessness, is first felt; and to these in one, two, or three hours, reaction succeeds. The pulse, if previously small, then becomes full, more firm, and more frequent, heat and dryness of surface increase, burning in the palms and soles, eyes and face flushed, increased thirst and restlessness, increased throbbing about the temples. Towards midnight or morning, however, some remission of these symptoms takes place, and the patient, worn out, probably slides into a slumber. Sleep, however, is restless, broken, and not refreshing,—he dreams, and probably thinks he sees things or places, at which he is frightened, and starts up, or, more comatose, is roused with difficulty. To this, however, no perspiration, as to a critical healthy sleep follows. On the contrary, the pulse continues as quick, and the skin as hot, hard, and dry as ever.

The duration of synochus varies, it may be one, or it may be three weeks, all depending on age, constitution, climate, and mode of treatment. If the disease is once formed, or fully established, and not broken up at once, by something decisive, it may then run on to a longer or shorter duration, and terminate ultimately n one of two ways—if the constitution is good, the disease tractable, and the treatment judicious, it may continue on functional, and terminate favourably; but if obstinate, and the constitution disposed morbidly, to functional, structural lesion may succeed, and death—morbid sympathies, morbid associations and tendencies, once produced, are not easily nor suddenly ruptured, but run on, and in many cases obstinately, in a series, or paroxysms in succession, to a longer or shorter duration.

The termination of synochus may be variously accomplished—it may be gradual—paroxysms may become by degrees lighter and later, pains and restlessness subside, and, with the return of sleep and appetite, the pulse fall, or more abrupt—after restless days and nights, calmness at length, with sleep, may steal on, and during the soundness of which, relaxation with perspiration take place, with a termination to the disease.

An unfavourable issue is usually indicated, by the obstinacy, intensity, or aggravation of the symptoms, and particularly by that of heat, headach, and delirium. When the first stage has been obstinately and perseveringly prolonged, and lesion or some structural change has taken place, corresponding symptoms, or those indicative of an unfavourable issue, then succeed—the pulse quickens, and becomes more feeble, delirium, from being high, becomes more low and muttering, the limbs, and by degrees the whole body, become clammy, and at first cool, then cold, eyes, from being vivid, dull, glazed, and half open, to every one or thing around, insensibility, subsultus tendinum, involuntary discharges—death.

The morbid vascular determination in fever, is generally visceral, to the brain, liver, lungs, or stomach, and the one, the greatest sympathiser and sufferer, the first. The tendency of all action, morbidly and obstinately prolonged, is in some part, and generally a viscus, and some form, obstruction, with its consequences, —disorganization, vascular visceral turgidity, interstitial, infiltration, change of structure, deposit.

Treatment.—The cure of disease is circumstantial —the line or principle general, the parts peculiar, or to be specifically, or according to circumstances, applied. Symptoms are the signs or marks, which, with the history, lead the treatment. Synochus, in its approaches varies, sometimes slow, sometimes more precipitate. In most cases, immediate confinement to bed becomes indispensible. If symptoms threaten to be severe, or the case occurs at sea in winter, the patient should immediately be put to his hammock—nothing in this case can be gained by delay, or allowing him to lie about.

Nutriment must correspond to the case and constitution. In acute fever, at the commencement, and in robust young men—low diet must be prescribed—animal, solid food, grog, and all ship's allowance must be withheld, substituting in their place arrow root, sago, gruel, barley-water. In old sailors, or those whose constitutions are worn out or weak, something more generous or more nutritive, or better calculated to stimulate, or strengthen the constitution, may then be required.

If reaction should be slow, and the surface cold, and particularly in stormy or wet weather at sea, warmth internally and externally, and without delay, will then be required—bottles to the feet and surface filled with warm water, or bags with heated salt or sand, warm drink, and, when necessary or practicable, stimuli.

The first or fundamental step in all treatment is purging, and in most cases imperative. Whatever objections may exist in any case as to bleeding, to this will rarely apply. Doses generally applicable, and generally efficient among seamen, at the commencement of fever, are a three, four, or five grain calomel bolus, followed after three, four, or five hours, by a three or four ounce draught of senna and salts—a jalap or rhubarb linctus—half a dram of the powder, five grains of calomel, and as much honey or treacle as make a linctus—jalap or rhubarb draughts—castor oil. If the stomach should prove irritable and reject these, pil. scammon. pil. aloet. pil. colocynth, comp., or calomel in a five or six grain bolus may then be substituted.

In young, sanguineous habits, and inflammatory, or febrile cases at commencement, purgatives, the most applicable, or most efficacious, are the saline, a two, four, or six grain calomel pill, followed after two, three, or four hours, by a saline draught—the infusion of senna with epsom salts, and with or without tartrate of antimony. Draughts of the description here noticed, lower more effectually and more immediately, particularly when combined with the tartrate of antimony, than any others, heat, the pulse, and generally the circulating mass. In depleting, or lowering power, next to bleeding stands purging, and more particularly the saline; and, if judiciously timed and prosecuted, may lessen its necessity, or altogether, in some instances, supersede it,—an object always to be desired—debility from the loss of the serous portion of the blood being so much less, and the convalescence therefrom so much quicker, than that from the loss of the colouring. In advanced stages, or debility, with the powers of life low, aperients then become more suitable, they are more intestinal, less colliquative, therefore so much better adapted—pil. rhæi. comp.—castor oil in small doses, seidlitz powder.

Of all therapeutic agents, in fever and phlegmasia, the one most powerful, most impressive, and, undoubtedly, most immediate, is bleeding, and the remedy, in general, best fitted for the diseases or habits of seamen—in tropical climates, the sheet anchor.—Bleeding, general or local, is indicated by the intensity of the heat, headach, or delirium—by restlessness, by the dryness and hardness of the skin, and by the pulse, its firmness, fulness, or frequency. During the stage of excitement, there exist always, in some degree or other, two states, but each on the other dependent—increased action of the heart and arteries—and visceral congestion. In the viscus affected, whichever it may be, brain, liver, lungs, or stomach, there appears always more blood than there ought to be, more than can pass readily through it—and the result is, congestion, and with that, morbid action. If, in such cases, relief is not by some means or other afforded, and that speedily, one of two things may happen, some of the vessels so congested may give way, and the patient die suddenly, or, through the congestion, serous effusion.

Bleeding, to be beneficial in this, or any disease, must be done to effect—measured, not by ounces, but the effect produced. In adults, 16, 20, or 30 ounces, will in most prove, at first, a full bleeding, but will vary with the circumstances. Some individuals, through idiosyncrasy or peculiarity of constitution, are readily impressed, more by the loss of 6 ounces, than others by 30.—Bleeding, in all cases, to be beneficial, must relieve heat, headach, and the pulse. If, at the end of 20, 25, or 30 ounces, there should be no syncope or no abatement in the symptoms, it may be prudent, however, then to stop, and watch, and rather repeat at the end of 2, 4, or 6 hours, if necessary, than draw at once too largely. The necessity of bleeding, or of its repetition, must be determined by circumstances. Diseases, as well as constitutions, differ, and that most materially,—in some, the loss of a little blood may be serious, in others not felt. To avoid injuries or accidents, in bleeding at the bend of the arm, and which are by no means so rare as they ought to be—caution in selecting the vein becomes necessary, and which is to be chosen, by its size, superficiality, fixity, and distance from the accompanying artery. Syncope, however induced, and whether by bleeding or otherwise, is always doubtful, and both as to its extent and duration, and therefore to be watched,—constitutional peculiarities vary, and are unknown. In some, syncope is removed by the horizontal posture, ammonia, or a dash of cold water—in others, protracted, and not unaccompanied with danger. The vertical position, in general, is the one to be chosen for bleeding; it, more readily than any other, indicates both the state and strength of the patient. Horizontally, some are strong, and the pulse strong, but, raised or placed vertically, sink; in such, general bleeding is rarely either beneficial or well borne—vertically, the abstraction of blood is most impressive and most immediate—the fulness of the cerebral vessels being soon taken off, and which is always to be considered, where that, as in fever or hernia, becomes an object. Should the surface be chilled, the limbs cold, and the pulse small or feeble at the commencement, or at any subsequent period, and not uncommon at sea or in winter, bleeding then would be not only injudicious, but probably injurious,—the nervous principle, and with it, the circulating system, become then too feeble, or too much oppressed or depressed, for vascular expulsion. The time, and the quantity of blood to be drawn, will, at all times, be dependent on age, constitution, the nature of the case, and climate. At the commencement, while excitement, with strength and stamina exist, bleeding is beneficial, but in debility or protracted cases, improper or impracticable.

Febrifuge mixtures, sedative and sudorific, are in use, but feeble in their nature—more useful as auxiliaries or placebos, than principals,—sol. carb. sodæ, in effervescence with citric or tartaric acid—sol. nit. potassae in 3, 4, or 5 grain doses, in combination with spt. æth. nit. tinct. digital. liq. am. acet.—or simply lemonade. The tendency of all action, morbidly prolonged, is, sooner or later, change of structure; this, in all cases, is to be feared, and to be by every means possible averted. Of all organs in the body, the brain, in general, is the one, in fever, the greatest sympathiser and sufferer,—more or less the others participate, but commonly cerebral derangement, or delirium, measures the danger, and which is to be averted, if it can be, rather by bleeding, blistering, and purges, than a febrifuge.

When, in spite of bleeding, purging, and blisters, heat, pain, and throbbing about the head, with a tendency to delirium, still continue, cerebral congestion, and abnormal cerebral action, is then indicated, and still more threatening and more urgent, if complicated at the same time with coldness in the limbs or body. This is to be combated, and the circulation equalized, by warmth to the feet and limbs, and cold at the same time to the head—shaving the hair, the first step necessary in all forms of fever, at least those of any moment—cooling evaporant lotions, and, when necessary or practicable, leeches.

Local bleeding may be often practised beneficially, and, in many, long after general. It acts locally or more immediately on the part affected, and without that constitutional disturbance or risk incidental to the other. In this way, blood in considerable quantity may be drawn from the part congested, and, duly or skilfully administered, with marked benefit. In typhoid, or advanced synochial, or tropical fever, leeching or cupping may be often practised, and with much advantage.

In fever, counter-irritants are useful. In local, sudden, transient, neuralgic, or muscular pain, or any pain that may be doubtful or not immediately made out—particularly in a man bad or damaged in character, sinapisms are the most suitable, their action being speedy, evanescent, and no delay incurred from treatment. In fever, or affections more permanent, blisters are preferable, their influence being more deep and durable, and may be kept up. Whenever, therefore, and notwithstanding bleeding and purging, pain still continues fixed and visceral, blistering is indicated.

By bleeding, blistering, and purging, most cases of fever, if at all tractable, in some measure give way, or are brought down, at least, from a first, to a second, or third rate action, but, if not arrested, operating still as surely in this state, although much more slowly than at first, towards a fatal issue,—during which, structural lesion, or changes incompatible with recovery, or life, take place. For this insidious, second, or third rate action, mercury, in some form, calomel or blue pill, becomes necessary, suiting to the case or circumstances the form, or dose. Calomel, or blue pill, may be exhibited in 1, 2, 3, or more grain doses, and 1, 2, 3, or more times daily, and with opium, or without it. Larger and more frequent doses being required in warm climates, and dangerous cases, and less in the temperate, and diseases of a more moderate or docile character.

In different individuals, and even in the same at different times, the susceptibility of the constitution for mercury varies, is always uncertain, and always unknown. In most, unless the case be the more urgent or dangerous, the plan most prudent is, to commence at first with small doses, and these afterwards, if necessary, gradually increased,—it will be the safest, and act at the same time as a feeler for the future. Some individuals are salivated, or mercurialized by 10 or 20 grains of calomel or blue pill, and others not by as many scruples, and which nothing external or tangible will indicate,—the object in view being to tender, or tumify the gums, not to ulcerate,—to influence gently the capillary system; but which must be kept up till the symptoms, or visceral vascular congestion, give way.

During the advanced protracted stages, when excitement has been lowered, and debility, or irritability become prominent, narcotics will be necessary. An anodyne at bedtime, in stilling the feverish tumult then present, or soothing to sleep, is often of great service. 30 minims of the tincture of opium, or hyosciamus, in an ounce of cinnamon, or peppermint water,—⅛ or ¼ gr. muriate, or acetas morphiæ, or a few grains of the extracts of conium or hyosciamus. With most cases or constitutions, opium or morphia agree, but not with all—hyosciamus, or conium, are more generally applicable, and will be found more generally beneficial.

To give force and firmness to the nervous system, or to rouse it, in the advanced or exhausted stages, stimuli or tonics become necessary. Quina, in suitable doses—wine, in quantity suited to the case and constitution—camphor, aether, ammonia. In less severe cases, where more of the tonic, and less of the stimulant is wanted—the mineral or vegetable tonics may be given—preparations of iron or zinc—infusions of quassia or colomba—and with aromatics and acids, or without them.

Synochus may terminate in one of three ways. It may, in a few days, through nature and art, successfully, or it may be more obstinate, and continue, although all the time functional, for three, four, or six weeks, yet terminate favourably, or it may be organic, and terminate fatally in a few days, or at some period more distant.

Through the substance of the viscus congested, the brain, liver, lungs, or stomach, (to illustrate the principle of congestion,) the blood would seem, on such occasions, to circulate more slowly than it enters. If the blood went through, and out of the viscus, as freely and as fast as it went in, it is obvious that no congestion and no obstruction could occur. It would appear, however, that the capillaries, ramified throughout the viscus so congested, do not, on such occasions, act in unison with those vessels which are merely blood-carriers, or intervene between it and the heart. If they did act equally quick and equally forcible, it is obvious that the blood then would be propelled with the same velocity, into, through, and out of the viscus, and no congestion, and consequently no obstruction, could occur. The stream of blood might be accelerated, but then it would be general, or equally so in the system and visceral substance. The fact is otherwise—while the vessels carrying red blood act quicker or more forcible, and push their contents with increased velocity into the visceral substance, during fever or phlegmasia—the capillaries there do not act in the same ratio, or not quicker than they used to do—or, if overloaded, not so quick, or are stagnant; hence congestion, and, if not relieved, obstruction. For this inequality of action between these two sets of vessels, the circulating and capillary, there are several reasons. First, the proximity of the vessels, carrying red blood to the heart—the centre of impulse; second, the greater ease with which fluids are propelled through large and strait tubes, as the aorta, or large vessels, in opposition to the friction and resistance encountered in the small and tortuous; third, the free unrestricted condition of the large vessels compared to the hampered state of the visceral or capillary.

The necessity of bleeding, or sanguineous depletion, under such circumstances, must be to all apparent. Without a diminution of the impulse, or quantum of blood circulating in the viscus, no relief to the vessels so overdistended, it is obvious, could be procured. The viscus or visceral vessels, so distended, are loaded, in the first instance, by excitement, but which again in their turn become, by their loaded or obstructed state, the very cause of excitement, the effect becoming in this way the absolute cause. On this disproportionate state of action of the capillaries, ramified throughout the visceral substance, and the vessels which proceed from the heart, carrying red blood, would seem to depend—the congestion, or that accumulation and stagnation of blood, so common in fever and all the phlegmasiæ.

A river, for instance, to illustrate this principle still more clearly, to prevent accumulation, obstruction, or rupture, must flow equally in all its parts. In those that are shallow, or narrow, the stream of water must flow quicker, or in proportion to the diminished state of the channel, that in a given space the quantity passed may be made up by speed what was lost in capacity. If a quicker motion than what is natural in the main channel or aorta, and however induced, is not followed, and that immediately, by a motion or action quicker, and corresponding thereto, in the small, narrow, tortuous ones or capillaries, accumulation then will undoubtedly follow, and with that, if not relieved, obstruction or rupture. This disproportionate state of action between these two classes of vessels—the blood-carrying, and capillary, is, it is conceived, what constitutes what has been technically called in fever and phlegmasia, the proximate cause, and not spasm.

If to increased action in the large vessels, the small or capillaries, do not proportionally respond, congestion of blood in the part will then undoubtedly follow, and with that, if not relieved, obstruction, or inflammatory action. This once induced, will necessarily, unless by some means relieved, continue, or be increased till taken off by bleeding, rupture, or effusion. On the stream of blood pouring into the congested viscus, that already dammed up there will necessarily react, and not only react on the stream inpouring, but throughout the entire extent of the sanguineous column, or onwards towards the heart. The heart, by the column of blood thus opposing, will necessarily become irritated, or still farther excited, and the congestion of blood, which at first was only the effect of excitement, become thus the positive cause. Relief to this state of things, it is obvious, can only be afforded by bleeding, by diminishing the quantity of blood circulating, or by creating such a vacuum in the entire extent of the vascular area, as not only to lessen the general quantity, but that to fill up the void thus created; blood may also be drawn from the viscus or viscera, so congested.

On nursing, or attention to the various wants of the case, much will depend. Taste is whimsical, always vitiated, and always changing. Drink, in large quantity, and every possible variety, will be wanted, and the cold acidulated generally preferred,—lemonade, orangeade, cream of tartar water, tea, toast and water, barley water.

In every case difficult or dangerous, a watch at night will become necessary—one or two persons, as the circumstances may require, who are sober, steady, and can be trusted—to give drink—to clean, move, or do whatever may be necessary.

Nothing is more disgusting, or more discreditable to the surgeon, than dirty patients, dirty attendants, or utensils. The want of cleanliness, where water, soap, and servants abound, is, to say the least of it, unpardonable. In summer, washing, shaving, and cleaning, ought to commence at five bells, that is, half-past six in the morning, that all may be over before seven, the visiting, or eight, the breakfast hour, and repeated, if necessary, in the evening. The bed, and every thing thereto belonging, must be clean, dry, and airy, and suited to the climate or season—warm in a cold climate, and light in a warm.

Nutriment in all cases must be regulated by the state or stage. During the first stage, or period of excitement, when action is high, little, and that only of the lightest quality, will then be required; and with bleeding and purging, acts powerfully. In advanced stages, or diseases of debility, something more nutritive or generous will then be necessary. When action, or the powers of life begin, as in the advanced stages of this, or any fever, to flag, stimuli, and those of the diffusible kind, with nourishment, will then be demanded—wine, brandy, camphor, ammonia, and in quantity sufficient the debility to control or counteract; and so given, that the stomach may never be at any time loaded, nor yet empty. In critical, and all advanced cases, these different items, or what is called nursing, is most important, and form often the pivot, or the hinge on which life and death turn. The administration of stimuli, like that of every other part of the treatment, must be regulated by circumstances, or the wants of the case. On ordinary occasions, stimuli may be given at first in small doses, frequently repeated, and gradually increased; but in extreme ones, as cholera, or the advanced stages of tropical fever, more freely and frequently, or in quantities sufficient, the nervous principle to rouse or sustain. Taste or habit is of some consequence. By old sailors, rum-grog, or rum-punch, is often preferred to any thing else, and often at such periods, more efficacious with them than either porter or wine.

CHAPTER VI.

FEBRIS INTERTROPICA CONGESTA.

This is met with in temperate, but chiefly in tropical climates. Of all forms of fever, it is the most serious, and, undoubtedly, the most unmanageable. The virus, the cause of it, abounds in all woody, marshy, tropical tracts, the focus of decomposition, and is rapidly, and too often fatally evolved, in new, raw, unassimilated constitutions, or, in all new-comers exposed nocturnally. In cold climates, this form of fever is less frequent, and also less frequently in extremis, than in hot. In cold climates, it occurs chiefly among those of weak or broken down constitutions, the consequence of age, of irregularity, or faulty structure,—and the result of cold and moisture at sea, or in winter, long, repeated, or applied intensely, and particularly when coupled with night duties—heavy, or harassing.

Fever of the true congested, depressed type, is not common in any climate. Of all forms, it is the least common, and least tractable. Fever, at first, is commonly inflammatory, generally, or locally,—this, however, atonic throughout. Causes predisposing, are—fatigue, harassing night watches, insufficient clothing, intemperance, poor living. Wherever these co-operate sufficiently, or, with the remote cause, so impressively, as to deaden or paralyze nervous power, this fever is met with.

This form of fever is more common in tropical than in temperate climates, although there even not so common as the inflammatory by at least a twentieth part—there, it is the issue of miasm, or a gaseous virus, the product of decomposition, emanated from jungle, marshes, or the depths and darkness of intertropical forests,—there formed, and thence volatile and virulent, radiated, acts violently, and often fatally, on all new-comers or unassimilated constitutions, nocturnally exposed. In the young and robust, or those who have their stamina unimpaired, and have been only partially, or for a short time only exposed, or have not taken in what may be called a full dose,—the fever resulting, in all probability, will not be the congested, but the inflammatory. In the unassimilated, or new-comers, or those who have their constitutions weakened naturally, or through some irregularity, and have been nocturnally exposed, or slept on shore near woods or forests, or uncultivated grounds, the fever then following, in all likelihood, will be the congested, or the collapsed—the issue of a virus or miasm, condensed or concentrated.

Of the nervous power, or principle, by or through which motion or action in the living system is created and carried on—through which circulation and secretion are influenced—and by which every function for so many years, and under so many different circumstances, is sustained and regulated, we know nothing.

Of this power we know nothing, we know not whether it is material or immaterial—a principle or a property—we know it is powerful—we know that, on its sound and healthy condition, whatever it may be, life and health, function and action, in the living body, depend; but, of the principle itself, like that of vegetation, growth, gravity, or decay, we know nothing—neither its nature, nor its form; we know, see, and feel its effects, derangements, or diseases, yet is itself not only unknown, but intractable, and whether in excitement, as in tetanus,—or collapse, as in cholera. On this, whatever its nature, form, or laws may be, miasm, and every febrile, or morbid cause acts, and must of necessity, in the first instance, act.

In cold or temperate climates, fever, whether catarrhal, synochial, or typhoid, among seamen, is generally more protracted, more varied, more membranous, and more manageable than in tropical, also less visceral, and the vis nervosa less extremely excited or depressed. In tropical, the disease is generally more intense, and more visceral, and, if the period of exposure be nocturnal, and long or repeated, incurable, or fatal.

Violent, and often intractable, as is the tropical inflammatory, compared with this, it is docile. To the lancet, and other measures of that nature, excitement, combined with strength and stamina, will generally, in some measure, give way, but, with the nervous principle depressed or paralyzed, as in this, such measures become inadmissible or injurious.

In tropical climates, the congested form of miasmal fever is generally quick, and, in the bulk of cases, intractable and fatal. In extreme cases, from first to last, prostration predominates—or there exists a sense of sinking—collapse, an incapability in the system of action or reaction, a subdued tone in all the functions and in all the vital actions; it is the opposite of febrile inflammatory action, the issue of an extreme dose—of a cause virulent and concentrated. In extreme cases, the nervous principle may never rally, as is too often the case, from the first depression. It may be so overcome or paralyzed by the miasm, the cause at first operating, as never to have the power to react, but give way, and the patient sink rapidly; or the depression may be less, and the constitutional capability greater, and reaction follow, as in synochus or typhus, or excitement, as in tropical inflammatory fever.

In this form, the premonitory, or initial stage, as is, in most instances, its whole course, is short. It is preceded or ushered in, as most fevers are, by languor, listlessness, giddiness, stupor, thirst, chills, flushes of heat, restlessness, loss of appetite, of sleep, —the premonitory stage. In a short time, or in six, twelve, or twenty hours, in extreme cases rarely more, symptoms more diagnostic or precise succeed; pains are felt about the head, arms, legs, or back, or in all,—pain in the head may be general, or seated in the back, base, or anteriorly, general, indescribable, intolerable, sinking, tremulousness; standing or walking difficult, or very soon impracticable; feebleness in the action of the heart and vascular system, the pulse small, feeble, fluttering, and ranging from 100 to 150,—thirst, dry parched mouth, nausea, tongue white or red, dry or tremulous, countenance pale, anxious or apathetic.

In extreme intractable cases, after the first two, three, or four days, if nothing favourable occurs sooner, there succeed coma, and often immoveable, low muttering, delirium, vomiting, surface and limbs cool, or the heat not raised; skin dry, hard, and burning, or clammy and cold, limbs cold, head and thorax at the same time burning, the vital and all functions subdued, imperfect, or irregular. As the disease advances, the tongue from white becomes brown, black, hard, and tremulous; involuntary discharges of fæces and urine take place, subsultus tendinum; catching at the bed-clothes or something imaginary; incessant, incoherent talking, all the symptoms of approaching dissolution; and in this manner the disease goes on in three or four out of five or six cases resolutely and obstinately, in four, five, or six days, to a fatal termination.

In the general state of symptoms here narrated, atony, or paralysis of the nervous principle, predominates,—in the low irregular temperature, in the feebleness of the heart and pulse, and that of muscular power.

On new-comers, or habits unassimilated to the climate or place, foreign causes or influences, local or climatorial, act, and with more or less vigour or virulence, but always by circumstances influenced.

Circumstances aiding the operation of such, are, bróken rest, fatigue, harassing night duty, cold, moisture, poor or spare diet, damp or insufficient clothing or bedding. Those obviating, or tending to resist the influence of foreign or morbid causes, are, sobriety, regularity, wholesome generous food, suitable dry clothing, assimilation,—the constitution, through time and nature, becoming slowly but insensibly localized or climatized, more fitted for the place or climate.

Assimilation may be local, or it may be climatorial. Local assimilation must be climatorial, but climatorial may not be local. On the African and every other station, seamen, after a time, get climatized, that is, they get habituated to the climate; their constitutions, by time and nature, become so changed as to be fitted to resist heat, the weather, or atmospheric changes peculiar there, but yet not localized, that is, not capable of resisting miasma, or local marsh effluvia. Of this there are instances without number. Seamen often, after a time, or after being months or years on a station, and undergoing successfully the ordeal of fever, or those diseases incidental at sea, from atmospheric or thermometric causes peculiar there, have, notwithstanding, fallen a prey, and that rapidly, when exposed to that from miasm.

The assimilating power or principle of the constitution, varies not only in different individuals, but in the same, from a variety of causes, at different times.

Circumstances concurring to assimilate the constitution, or enable it to resist disease, are—sobriety, regular habits, cleanliness, clothing, diet; those opposing this change, or predisposing to disease, are the reverse, dissipation, want of clothing, poor or spare diet, cold, moisture, fatigue. On new or unseasoned constitutions, or more properly, on the nervous principle, all new or foreign causes act, but variously, on some slightly, on others severely or fatally, and all depending on the state of the constitution at the time.

A gentleman, a Dr. Southey, lecturing lately at the Gresham Hall, is reported, by the public papers, while on fever, to have stated, that the African marsh fever was brought on board the Eclair steam vessel by a single person, and that out of 145, 65 died, and that any fever, by confinement, would become contagious. If from this, it is to be inferred that the African marsh fever, which this on board the Eclair appears to have been, is contagious (the word made use of in the paper,) but which ought rather, it is conceived, to have been infectious,—words conveying meanings, about as distinct as black and white—the one referring to a gas, the other to a fluid. If such, it is repeated, is the inference to be drawn from this statement, this I, from experience, beg most positively to deny. The African marsh fever, it is here contended, is neither infectious nor contagious. As example is better than precept, in conveying intelligibly and forcibly from the mind of the writer, to that of the reader, what is meant, one or two shall be given; premising, however, that the

African marsh fever may be generated on board, as appears to have been the case on board the Eclair, and thence radiated as easily, as rapidly, and of a nature as virulent, as on shore or in jungle.

In the year 1822, and for three years before, the Pheasant sloop formed one of the African squadron. This ship, although constantly at sea, and on salt provision, had always been healthy. Cases of fever of a synochal or inflammatory nature, from exposure to the sun or atmospheric changes, had from time to time occurred, but nothing diffused or intractable. This was the case with the men,—with the officers it was different. During the same period there were attacked with the marsh fever and died, a lieutenant, a surgeon, a master, a carpenter, and a gunner. These cases were every one of them marsh, but at the same time sporadic, that is, they went no farther than the individuals attacked. They were every one of them contracted on shore, at different parts on the African coast, at Sierra Leone, Cape Coast, and others, yet remained, from first to last, and without any precaution, limited to the individuals exposed. These officers were moved, cleaned, washed, dressed, and, when necessary, buried by their messmates, or servants, or those whose duty it was, yet the marsh African fever, in these instances, was never once transmitted.

Between these cases, and that of the Eclair, it must be here remarked, there was this difference—the virus, the cause of fever, in the first, was generated and contracted on shore ; in the latter—undoubtedly, on board. There was also this difference, it may also here be remarked, between the fever among the officers of the Pheasant, and that among the men, which will, in some measure account for the very different ratio of mortality,—that, while the first had leave to go on shore, and thereby contracted miasmal fever—the latter had not, febrile cases among them, therefore being not miasmal, but atmospheric—synochus, or catarrh.

The Pheasant, about this time, that is, in 1822, was employed on an astronomical and botanizing expedition, and about July of that year, anchored at St. Thomas, an island on the Equator. Accordingly, instruments for the purpose intended were here landed, and fixed up at an old house, surrounded with flats and swamps, close to the shore, and with two marines to guard them. During the day, and all the time the ship was there, the whole of the crew were exposed to the sun, and to any miasm there might be, in wooding and watering; but at night, it must be remarked, excepting these two, all slept on board. After a residence at this house, of some four or five days, first one, then the other, began to complain, and of the symptoms which have been already detailed. These men, accordingly, were relieved, and brought on board—two others being sent in their place. In a few days, and in a similar manner, these men also complained, they also were relieved, and two others sent, and in a few days more these also complained, and were brought on board, making, with two others who with great difficulty recovered, eight in all.

In this gentleman's lecture it appears to have been stated, that the African marsh fever was brought on board the Eclair steam ship by a single person, and that out of 145, 65 died, the inference naturally is, and must be, that the virus, poison, or whatever the cause of the fever might be, was transmitted from this single person to the 65, or that it was in the highest degree infectious. This, it is here repeated, the writer, from experience, most positively denies. Of the Eclair's case nothing is known to the writer, nor, in all probability, to this gentleman, farther than what the public papers afford; but of the one now detailed the writer was an eye-witness, being at the time assistant-surgeon of the ship. These cases, now mentioned, were all of them, except two, in a few days fatal. Nothing seemed in the smallest degree to arrest or abate their virulence. The men were attended, washed, dressed, moved, lifted, and buried by their messmates, or those whose duty it was, and without precaution or limitation of any description, and without the slightest idea of such being necessary, and what was the consequence?—not a case was transmitted. The rest of the crew, during the day, were exposed infinitely more to the sun and fatigue than ever they were, yet remained healthy, but then, it must be particularly remarked, they slept on board, they were not exposed to the miasm, to the land effluvia rising at night from the ground, or thickets and swamps around, and so destructive to constitutions unassimilated.

The fever in the Eclair, it is stated, was brought on board by a single person, and transmitted in a variety of climates, and not excepting our own, to 65. Here it was brought on board by eight, in an African climate, in a temperature ranging from 80° to 90°, in the focus of miasm, and yet not transmitted. This is one instance only out of a hundred, and of the same nature, that might be adduced. In these two cases, it is obvious that something essentially different must have existed, and here it was. In the Pheasant, the miasm, virus, or cause of the fever, whatever it was, was imbibed on shore, where it existed, and not on board; it did not extend to the ship, to half a mile, her distance from it. In her the atmosphere was pure, not pestilent, as it undoubtedly must have been in the Eclair; and the fever not being naturally infectious, or the constitutions of the men attacked not being capable of concocting and radiating the virus, was limited to them, and disappeared with them. In the other, it is here again distinctly maintained, that the fever was not carried on board, but that the virus or miasm, its cause, was formed and radiated in the ship, as it has been before, times and ways beyond number, and continued to the last to be so, and not in the bodies of the men as asserted, but in the limbers, or other parts concealed—the issue of deposition and emanation, or heat, matter, and moisture.

The consequence of opinion on all such points, renders their discussion in the highest degree important. It has been the custom too much, it is necessary to say, to impute to infection or to contagion, for the two are often so jumbled or mixed up together, as to mean, sometimes different things, and sometimes the same, to impute, it is repeated, to some unknown cause of this nature, what, in reality, has been the consequence, as will be generally found out on inquiry, of deposition or decomposition. That the atmosphere on board the Eclair was in the highest degree pestilent there cannot remain the shadow of a doubt; but then it arose, it is conceived, not from the bodies of the men, as seems to have been supposed, but that of the ship. No person, under any circumstances, it is here contended, could have carried the miasm out of this ship and radiated it,—the winds, sun, and air around would have destroyed it; but then no person could have lived or slept with safety on board,—it would have been sleeping in a miasmal atmosphere,—like sleeping in the bosom of an African forest.

The difference between climatorial and local assimilation, it may be here remarked, was well demonstrated in the case of the Pheasant.—The men attacked, in that instance, were all, except one, (the botanist,) climatized; that is, they had all been on the African station three years and upwards, therefore well seasoned to heat and climatorial atmospheric changes peculiar there, but yet not localized,—their constitutions had not been so changed as to enable them to resist local marsh miasm, only to be acquired, it is to be here noticed, by local residence,—therefore were no sooner exposed than they fell a prey.

This subject has been drawn out already to a length much greater than at first intended; but being one, it is conceived, of the very first importance, shall give one other sample, but in a brief manner, illustrative of the principle here advanced.

In the year 1766, the Phœnix frigate arrived at the same island, that is, St. Thomas', on the line, and it is believed at very nearly the same place, from the coast of Africa. At the time of her arrival she was healthy, as she had previously for some time been. Men in numbers were immediately sent out in different directions, during the day, wooding, watering, and in other parties, but slept on board at night. This, it may be mentioned, is narrated by Dr. Lind. For some particular purpose or duty, however, sixteen of them were ordered to be left on shore, and for several nights and days together. In about a week from this, all of them so left were attacked with fever, and of these, three only recovered, and thirteen died; but not a case occurred, it must be particularly remarked, among the rest of the crew. The following year, 1767, the frigate returned to the same place. Again, as before, all were exposed to the sun and fatigue during the day, wooding, watering, and in other duties, but slept on board at night; and again, for some particular duty, ten men were ordered to be left on shore at night. In a few days again from this, all of them so left were attacked with fever, and of these, two only recovered, and eight died; but still no case occurred among the rest of the crew, exposed as they were, and necessarily must have been, and in every possible way, to the sun, fatigue, and their sick shipmates. Cases of the description here narrated might be multiplied to any extent or number. So much for infection from African marsh fever.

Treatment.—Of all forms of fever, it has been already remarked, the tropical congested is indubitably the least under control. By the lancet, and other measures of that nature, excitement, however formidable, may be in most, in some measure brought down; but allaying or reducing action is one thing, raising it another. In all the actions or functions of the body, prostration predominates—in the action of the heart and arteries—in respiration—in temperature. Depletory or depressing measures—full bleeding or purging, in nine out of ten cases, are injurious or inadmissible. When bleeding, general or local, becomes absolutely necessary, it must be practised, both cautiously and sparingly, or with due circumspection, both as to the effect, immediate and ultimate. Large or general bleedings are rarely if ever beneficial, or practicable in this fever. Blood taken even locally, or in a very small quantity, may be serious, or expedite rapidly the fatal issue. Local, however, is more suited to the depression existing in this fever than general bleeding, and very often the only form practicable or proper. This even, however, must be practised with judgment and discrimination, or with a proper view to the circumstances of the case and constitution. In this, as in most others, the head or cerebrum bears the onus, and with it the lungs, liver, spleen, or stomach, are generally at the same time more or less congested, or obstructed. As the symptoms or congestion indicate, so must the bleeding, general or local, vary.

Purging, or unloading the bowels, is undoubtedly the first step necessary in all treatment, but, to be useful, must be regulated by the circumstances or symptoms. In prostration, or depressed nervous power, full, or watery purging, like full bleeding, is generally injudicious or inadmissible. From treatment of this description, mischief incalculable may rapidly or fatally accrue, rarely or never benefit. The bowels, as a primary step, being once cleared, may be afterwards, when necessary, acted on by some warm aromatic purge, but cautiously and prudently. One motion only, or at farthest two, being daily procured—a draught of jalap or rhubarb, with the aromatic spirit of ammonia—a linctus of either with cinnamon or ginger—scammony or colocynth pills—or castor oil with the tincture of rhubarb, in small doses.

In this form of fever, atony or cerebro-spinal depression predominates, and with it, the loss of the power to act or circulate, or to sustain functional or visceral action, hence congestion or obstruction. To allay nervous action is easier than to rouse it, although that sometimes is not easy. Nothing is more difficult, or often more hopeless, than to stir up the nervous principle, once deadened or fairly collapsed,—as in cholera, or tropical marsh fever.

Remedies for the purpose here indicated, may be applied internally or externally—the internal are the diffusible stimuli—wine, brandy, ether, ammonia, and their compounds—the external, the warm bath and counter-irritants applied to the spine,—a powerful remedy, one much to be commended,—or to other parts of the body, singly, successively, or combined. Whatever stimulus may be chosen,—and the state of the stomach, taste, or habits, must regulate that,—to be beneficial, must be given largely and frequently, and regulated by the effect, not the quantity—liberally, and continuously, or in small quantities, frequently repeated. For the purpose of raising temperature, and at the same time tone, and thereby equallizing the circulation, with stimuli internally given, may be conjoined the warm-bath.

On energy, decision, and determination, much, in all cases, will depend, particularly in tropical or unhealthy climates, and among dense bodies of men. To be successful, there must be skill and judgment, and both in the selection and combination of remedies, as well as their particular application, or a proper adaptation to the wants of the case. To rouse or sustain nervous energy, stimuli alone, or unassisted, given internally, may be wholly inefficient—but, in combination with warm bathing, counter-irritants, or local bleeding, where that is indicated, successful. Where, from the state of the weather, patient, or ship, a warm bath may be inconvenient, or, as it often must be, particularly at sea, in small vessels, impracticable, warm fomentations, bottles, or tins, filled with warm water, may then be made use of.

Counter-irritants, generally most practicable, most speedy, and most beneficial, in such are, sinapisms, continuously, successively, or simultaneously applied, to the cervical, dorsal, or lumbar vertebræ, or legs and arms. In visceral, deep-seated, or fixed pain, or capillary congestion, or obstruction, blisters are best—but in atony, or diminished nervous power, sinapisms or turpentine. With the use of stimuli, warm-bathing, and counter-irritants, local, but seldom general bleeding, may be beneficially conjoined. By the local abstraction of blood, the quantity in the part or viscus circulating, and with that the volume, is reduced, and the vessels, circulatory and capillary, unloaded or relieved, and, by the exhibition of stimuli, at the same time excited. A double spur to circulation or secretion being thus given, first, by the bleeding—second, by the stimulus. With the same view of removing visceral congestion or obstruction, calomel or blue pill may be associated, and sometimes with benefit, but in doses proportioned to the case and its urgency—mercury, however, is generally more successful in raised, than in depressed morbid action, but, in a virulent intractable case, nothing in the slightest degree promising should ever be untried.

In no fever is the management more delicate, or more critical than in this. If, by any means, natural or artificial, visceral vascular congestion be corrected or removed, and the functions of the part reanimated or restored—reaction, and with that, recovery, may then follow ; but if that should prove impracticable, or congestion with obstruction should continue, death, sooner or later, and that inevitably, will then be the issue.

With the case—the diet must correspond. All ship's allowance must be withheld; and aliment only the lightest and blandest admitted—arrow-root, sago, beef-tea. The state of cleanliness, the state of clothing, and of bed and bedding, must be looked to, and the hammock, or, if necessary, a cot ordered, dry, clean, and airy. If symptoms should be slight, not pressing or doubtful—rarely, however, is this the case,—confinement to a hammock or cot, if inconvenient, which, at sea, particularly in small or crowded vessels, it frequently may be, might be for a little delayed, till the case is better made out, or more urgent. In the bulk of cases, however, the disease, in general, is too pressing or too palpable to be even for one hour delayed.

In all fevers, as already repeatedly remarked, but which cannot be too prominently or pressingly brought forward, ventilation is indispensable, particularly in hot climates, hot seasons, and among men in masses. Air, to be wholesome, and counteract what may be effused or emanated from deposition or decomposition, must be circulating and unrestricted, open to the sun and winds, or the ingress and egress of pure, dry, aerial atoms, continually going forward.

Drink must be suited to the stage or state. In some, thirst is urgent—in some, more moderate—and in some, almost entirely wanting. Variety is always required—toast and water—barley-water—lemonade—tea. In this, as in all fevers, on cleanliness, ventilation, and nutriment—or, what is termed nursing, much will at all times depend.

When tone has been raised, and atony or collapse overcome, a change in nutriment and medicine will then become necessary,—something more nutritive and more generous will then be required; and for the diffusible, the permanent or tonic stimuli—infusions of quassia, colomba, or gentian—extracts of gentian, or cinchona—preparations of iron or zinc. With some, wine is most beneficial; with others, porter—but circumstances in each must determine. In old sailors, who are stiff, debilitated, or worn out, in whom function or action flags, rum grog, or warm rum punch, will be found to be the stimulus often most agreeable and most useful—sits on the stomach, and works better with them than either of the others. As convalescence advances, for sago, and others of that nature, something more substantial and more reparative must then be substituted—mutton broth—broiled beef—broiled chicken—fish—eggs — pudding — and which circumstances alone must determine.

Of the case of fever in the Eclair steam ship, and others of a similar nature,—unfortunately on foreign, and particularly tropical stations, too common,—two views, as to cause and its continuance, distinct from each other, and leading to consequences as distinct, may be taken—that of infection, and that of miasm. In the one, that of infection, the origin of the fever, and the cause of its continuance, whatever that may be, is to be viewed as irrespective wholly of the ship, being the consequence of emanation, or virulent effusion, from the bodies of those under disease, and that imparted. In the other, that of miasm, as the consequence of emanation or virulent effusion, from decomposition, or something deposited in some part of the ship, and there germed and radiated, and wholly irrespective of the men. It is not difficult to see, that causes originating from sources, and under circumstances so very different, may, in the end, lead to consequences or results as much :—in the one, that of infection, to restrictions, harassing, obstructive, and, according to the sanatory code, in a multitude of ways inconvenient —in the other, to what will prove nine times in ten, in ships at least, the true one, clearing and cleaning. If the view taken was a theory, a thing merely to be talked or reasoned about, it might still, and without injury, for ever remain theoretical; but entailing, as it does, consequences, and those of no ordinary kind, becomes at once the subject of attention both grave and serious.

The object of this chapter, it will be easily perceived, is, in a great measure, to discuss, and it is hoped establish, the non-infection, or non-communicable nature of African marsh or miasmal fever. With this, two points remain still to be considered, but briefly, intimately connected, and involving consequences neither few nor simple. First, infection, it is generally believed, exists, or can only exist or be radiated during or after disease, but not prior—no man in health, or until he had been under disease, was ever known to be infectious—as being capable of germinating in his body, and radiating therefrom the virus of disease, unless previously, or at the time, under it. Those persons, therefore, who are in health, or who are not under disease, as we shall say, for the purpose of example, that portion of the crew of the Eclair who were not attacked, are not capable of germinating, not capable of radiating the virus, therefore not, in the strict sense of the matter, amenable, or ought not to be, to restrictions or sanatory legislation. Second, miasm, or the virus, the cause of disease emanated through the decomposition of matter, is not to be transported. Experience confirms this, although opinion with many contradicts it. Miasm may be inhaled at its source, and often is, but not carried, and not communicated,—the cases of the Pheasant and Phœnix, and hosts of others, prove this. Intermittents are produced by miasm, but in those only inhaling it at its source.—Tropical marsh fever congested and inflammatory, is produced by miasm, but in those only inhaling it at its source, in neither is it to be carried or communicated, the sun and atmosphere around prevent that.—With impunity during the day, the woods in tropical countries, and even the most primeval, where spade and plough have never reached, may be traversed, as the writer has done often, both in Africa and America, but let no man try it at night—death then, in the form of fever or miasm, lurks in every corner, hovers around every bush, to the constitution that is unassimilated or the new comer. Miasm, condensed and concentrated, through the absence of light and heat, rises emanating from the debris and decomposition around, but, like the morning cloud or the early dew, through the influence of the sun, the great purgator, the air and winds, which on every thing aeriform or miasmal act, soon passes away, reduced to its original nothing.

CHAPTER VII.

FEBRIS INTERTROPICA VIOLENTA.

This form of fever has had various appellations. From bilious, cutaneous suffusion, sometimes present, it has been termed yellow fever—from this and paroxysms, bilious remittent—from climate, tropical endemic—from locality, West Indian or African—distinctions, however, altogether circumstantial. In all cases of disease, circumstances modify, and will no doubt continue to do so, with shades and grades without end. However modified by circumstances this fever, in its nature, symptoms, or mode of attack may be, two circumstances mark it—first, it is always inflammatory during the first stage—second, it is never met with but in a hot climate, or the hottest season of a cold one. It is never met with in winter, or cold or frozen regions. It is a compound fever, but an extreme one—first, a synocha, afterwards and towards the end, a typhus.

In hot climates, or where it becomes prevalent, this fever is exhibited variously, sporadic, endemic, epidemic. In all tropical countries, sporadic cases of the disease are continually occurring, particularly among the young, unseasoned, or new comers—from dissipation—from bathing or sporting in the sun—from following out imprudently European habits and customs.

For heat, and the general atmospheric change, little, perhaps no allowance by such is made, exercise being continued with them as violent, and living with many as high, and more ill-timed than ever, consigning to a premature grave hundreds of the young and unthinking.

This fever is also exhibited in an endemic form. It is indigenous in hot climates, and ships there, damp and dirty—the issue of deposition or decomposition—or wherever matter co-operates with heat and moisture, or come into close, effective, and simultaneous operation. Matter is acted on by heat and moisture,—this every ship affords, more or less, in her holds, store-rooms, limbers, and numerous creeks and corners. It is indigenous also, or the virus, the cause of it, in tropical woods and forests.

A dirty, lax, disorderly ship is, in hot climates, nine times in ten sickly, and, what is worse, inefficient. A clean, properly disciplined, organized one, on the contrary, as often healthy, and what is more, fit at any time for any service or duty. Clean a ship from the limbers upwards, or let every thing within her be taken out, washed, white-washed, aired, and dried, the source, or the nucleus of fermentation and evolution, will thus be removed, and with it disease. Eradicate from a ship drunkenness, fighting, selling clothes, insubordination, (all fertile sources of disease among seamen,) and let order, sobriety, and system be established, disease, with its source, will then disappear, and health return.

Particular or local effects mark particular or local causes. Causes cannot operate without effects, nor effects take place without causes. Again, from the same or similar causes will issue, and throughout perpetuity, the same or similar effects, but never dissimilar.

Disease is general, or it is local. Disease may be general in a fleet, or limited to a ship or two. If general, the cause then acting must also of necessity be so, and, in all probability, atmospheric. If limited, the cause then must also be limited, and probably endemic. In the ships attacked, there must evidently at the time be something peculiar or existing there, which is not elsewhere, or in the others.

Epidemic causes operate generally, or epidemically, endemic, peculiarly, or locally. The endemic cause may be either foreign to the ship, or indigenous, that is, it may be generated either on shore, in woods, or marshes, and thence imported, or in the holds and limbers. In both, the disease resulting will be limited. If the cause is foreign, or generated on shore, the effect, or the disease resulting, will then not only be limited to the ship, but also to those individuals who were exposed to the night air, or effluvia, as was instanced in the Pheasant and Phœnix. If indigenous, the case then will be different, although limited, like the former, to the ship. It will be there general, or all persons there without distinction, and whether they have been on shore or not, will then be attacked, but particularly such as have slept below, in cabins, tiers, or cockpits, as in the Eclair.

In investigating the source or cause of disease among seamen, it is not to the upper parts or works of the ship we are to look, which are necessarily exposed, and through exposure harmless, but to the deeper and darker, or those parts which are shut up, damp, and stagnant-holds, store-rooms, magazines, or all under hatches.

From the outer aspect of a ship, much may be learned of the interior, or what is within—or from what is seen, of what is not. A slovenly, neglected, dirty ship or crew, will nine times in ten be the same within. A ship, however, may be clean, painted, and polished without, or about her upper works, but still ill-conditioned, or ill-ventilated below—a more common, a more deceiving, therefore a more dangerous case. In every search after the cause or source of disease among seamen, we must look, therefore, not to the upper, or exposed parts of the ship, but to the interior, or to all those under hatches.

The accumulation of matter, the source of decomposition, germination, and disease, may take place in the holds or limbers, or in both. The holds may be cleared, washed, white-washed, and ventilated; yet, if the limbers be not opened and cleaned, nothing may be gained.—The limbers of a ship are, it may be necessary to say, two in number, one on each side the keelson, and commonly extend from stem to stern,—triangular, empty, being the spaces intervening between the limber boards and keelson, and unless the ship be bottle tight, (a rare phenomenon,) moist. Over, or on these limber boards, rest the whole contents of the hold—water—stores—provisions. Into these hollow ways or limbers, then, water, and however introduced, from all parts of the ship's bottom trickles, finding its way by descent at length to the pump well. Water, unmixed with other matters, may, in the limbers, be harmless; and, undoubtedly, in a cold climate often is so,—but, mixed up with debris, animal or vegetable, in a hot one, and particularly in a close-bottomed ship, often the source of disease.

Ships are sweet or foul, in proportion to their leakage—open, leaky ones, being generally most sweet, and those that are close, or tight-bottomed, foul, or fetid. The state of the limbers, or inferior interior parts, may be in most, in a great measure, gleaned from that of the water pumped up, being copious and clear in the former, and fetid or foul in the latter. In hot climates, and close-bottomed ships, water, in the limbers and pump-well, termed bilge water—through seclusion, stagnation, and matter, very often becomes fetid, and very soon offensive. On the state of these parts, (holds, limbers, and pump-well,) in all ships, and all climates, much, and not easy to say how much, the health and comfort of the crew, or all will depend, and much more than is commonly imagined or thought of.

Example is better than precept—more forcible, and more lasting. Some years ago, it is believed somewhere about the year 1826, the Pyramus, a frigate, was employed on the West India station. After being for some twelve, or perhaps more months there, the crew, after having been all previously healthy, became suddenly, and, without any obvious cause, attacked with fever. From the very first onset, the disease betrayed itself as violent, phlogistic, and intractable, and very soon alarming ; and what was the worst feature of the case, no reason could be given. There were some points, however, which, although material, appear to have been overlooked in this case, bearing immediately on its nature and cause. The disease, for instance, was limited to this ship ; no other in the squadron had it at the time, therefore it could not have been an epidemic. It was uninfluenced in its violence or virulence, by change of place, or the disease was the same at sea as in harbour—therefore the cause, whatever it was, must have been in her, or carried about with her, or endemic. A great number of the crew, both officers and men, were attacked, and died, and, without any distinction as to rank or age, or whether they had lived and slept on board or on shore, indicating that the cause, whatever it was, was indigenous, or in the ship. In this disease were exhibited all the symptoms of the most virulent tropical endemic. In a short time, half, or perhaps two-thirds of the crew were attacked, disabled, and laid up.

This ship, like many others, was clean in her decks or upper works, clean where it was not of much consequence ; but, as it proved afterwards, unwholesome and pestilent below—a fallacious—a too common—a very dangerous case. After various speculations as to the nature and cause, and antidote to the disease, and, after the loss of much time, and both officers and men not a few, it was then resolved, as it ought to have been at the first, to clear and clean the ship.

With this view, the frigate was taken to Antigua. At first, in clearing out the holds, nothing was discernible, calculated in the least to elucidate this subject, all seemed as it should be, and, had the search gone no deeper than the holds and pump-well, and that was possible, the cause would probably have not been ascertained. The limber boards, however, were taken up, and then the cause of the disease came into view. In, and throughout the limber spaces, was found accumulated, and that to a very considerable amount, matter, black, blue, and putrid, both animal and vegetable, and of all colours and stages of decomposition. From all parts of the limber spaces issued, and with noxious ebullition, gases sulphuretted, hydroguretted, or virulent. Of those persons who were employed in this duty — all, or the greater number of them, were attacked with fever,—some died, and some with very great difficulty recovered.

This fever is also epidemic. Of changes in the atmosphere we know little. From effects only can we judge of causes so inappreciable, of a body so invisible and so intangible. Changes in the atmosphere are incessant and universal—in temperature—density —moisture—electricity, and others, there are still more curious and more morbid, although little known. From these, no district or no country is exempt. In the West Indies, or coast of Africa, for instance, for a series, for perhaps five, six, or seven years, nothing is seen or heard of general or diffused fever—all then is sporadic, or the cases of fever then occurring—the issue of drunkenness—exposure to the sun, or miasm. Suddenly, however, and without any cause obvious or visible, diffused or general, fever appears, and often simultaneously, at different, and often very distant places. What, then, it may be asked, is the cause? Every thing visible or tangible, remains as before. There are from year to year the same vegetation, the same plants, the same temperature, and, as far as it can be appreciated, the same atmosphere—the hills, plains, and soil remain the same, and the inhabitants live as they have always been accustomed to do.

Something, however, undoubtedly has taken place, or, there has come into existence and operation, without a doubt, some general or atmospheric agent, or virus, which was not the year before.

During these periodical, or sickly seasons, as they are termed, all ranks, and all ages, but particularly the unassimilated, or new-comers, are attacked. After some period, but always uncertain, and also without any obvious cause, a change, or a mitigation in the virulence of the disease takes place—symptoms then become more manageable, or milder, or the disease less frequent, and less fatal; and, after subsisting in this way for weeks or months, but always uncertain, declines, and gradually, but insensibly disappears—but to be, after some period, but also uncertain; or, after five, six, or seven years, and without any obvious reason, renewed as before.

From general agents or causes, general effects issue, but not such as are local. From the atmosphere alone, distant and diffused diseases can issue — distantly, spontaneously, and simultaneously rising, and distantly, spontaneously, and simultaneously disappearing.

This fever, then, it is obvious, is not the product of one, but of various sets of causes—sporadic, from exposure to the sun, or excess; endemic, from miasm; and epidemic, from aerial morbific changes.

On the atmosphere depends life and health. By it every operation in nature is influenced. Its operation on the living system is complex—it operates chemically—it operates thermometrically—it operates hygrometrically, and by its electric principle. The influence of these, on life and nature, are obvious and felt, but the agents, the cause thereof, or the changes themselves, inappreciable—changes depending on something new, and only occasionally occurring, either among the aerial constituents themselves, or them with others.

If no change took place in the atmospheric body, or it remained at all times and all places the same, it is clear that no diffused or epidemic disease could or would occur; but that they do, from time to time, take place, and of very different natures, remains without a doubt, and, consequently, their causes, or the changes, or viri which induced them. In the West Indian and African climates, for instance, for five, six, or seven years, but always uncertain, health appears general and established, fever, where it does occur, is then sporadic, moderate, and manageable. Some year or season, however, and without any visible cause, fever suddenly, and often simultaneously, appears at different places, and both diffused and intractable. What then, it is asked, is the cause? Why is one year or one season more sickly or more healthy than another? Every thing around visible, the soil, the temperature, the climate, and the relative position of the inhabitants, remain as before. On what is always present, and always the same, it is obvious such occurrences cannot depend, but on what is only occasional and fluctuating, or atmospheric.

Is this fever infectious? This is an important and all-absorbing question. Can the virus, the cause of this fever, be concocted primarily or secondarily in the living system, and thence radiated? Obscurity naturally surrounds all such subtile, intangible, invisible subjects, and, by experience and observation alone, can a *bona fide* knowledge ever be acquired, if it can be, of their laws and nature—if any thing, it is contended, it must be a secondary not a first cause.

Infection succeeds, never precedes disease, therefore must be a property, or a something acquired or engendered during or under disease, a secondary, therefore, not a first cause. In every disease there must have been a first case, and however remote. From some source or cause this first case must have proceeded, but not from infection, to which it must have been prior, anterior, or pre-existent, and of which, therefore, it necessarily was and must have been independent.

Is this fever subsequently or secondarily infectious? Can it be brought into existence by an endemic or epidemic cause, or some contingency, and then, by infection or some hitherto unknown process in the living system, radiated? In secondary as well as primary infection, there is much that is fallacious. For instance, had any party of men gone on board the Pyramus, (already mentioned,) to do duty in her enfeebled and sickly state, and a very probable proceeding, the most likely of all things would have been, that most or all of them, according to their several susceptibilities for disease, and however inured or seasoned to the climate or their own ship, would have been attacked with fever, and, according to their several stamina, or powers of recovery, recovered, or their morbid predisposition, died, and what then would have been said? Just what was said in the case of the Eclair, and what has been said in a hundred others before, that the disease sprung from, and was continued by, infection, while, in reality, infection had nothing whatever to do either with its origin or continuance. It would not have been imputed, (supposing the cause not to have been found out,) to deposition or decomposition—a want of cleanliness, a want of ventilation, or discipline, the cause of nine out of ten cases of fever or disease among seamen; but to a something no one could see, or no one could find. Idea of itself, or not acted on, is nothing, an exertion merely of the brain, but carried out has consequences. From right ideas spring correct action and consequences, but from false ones, such as may be serious, and so it is with the cause and consequence of fever.

In this fever all is extreme, excitement or depression. In its attack it is often sudden, particularly in violent cases, sometimes more dilatory, but rarely protracted. The disease is naturally of a violent and rapid character. In some cases uneasiness, or some disagreeable feeling, may give warning of what is approaching, but, in general, the period is brief between the vigour of health 'and that of disease. In violent cases the attack may be momentary—a fit of giddiness, headach, or delirium, being the first and only announcement. The premonitory and all stages are short, the disease being rapidly, particularly in new comers, and often with violence, unfolded. In this there are no hours or days of uncertainty or doubt, as in typhus or synochus, as to the disease coming, here all is quickly and often furiously evolved.

This is naturally a compound fever, first a synocha, afterwards, and towards the end, a typhus. The premonitory or dubious stage is short, indistinct, and soon over,—symptoms more diagnostic, or more defined, soon appearing. After two, four, or ten hours, rarely more, of weakness, uneasy feelings, chillness, thirst, or all the symptoms of a premonitory stage, the first, or stage of reaction begins—pain, sometimes intense, is now, if not before, felt in the temples, orbits, and forehead, sometimes in the vertex, or occiput, but generally anterior, indicative of serious cerebral congestion—pains, sometimes acute, often dull, in loins, limbs, and back—pulse, ranging from 90 to 100 or 120, firm, full, bounding, and feeling often like a rod of iron—mouth dry and parched—saliva scanty and thickened—tongue dry, and at first white—thirst urgent,—a desire for drink, cold and acid—urine scanty, hot, and high-coloured—skin dry, hard, and burning—nausea, and sometimes, and not unfrequently, vomiting—restlessness—want of sleep. During this stage, or the first four-and-twenty or eight-and-forty hours, all is functional or actional, but extreme or morbidly augmented—a brief but portentous period, and then follows, if not relieved, and rapidly, obstruction, or the second.

During the first, or inflammatory stage, action in general is too high, or too much for nature to support, to be long functional or lasting. In most cases, if not at once, or in a few hours, arrested, effusion, infiltration, or rupture in some organ or cavity, in six, eight, or in very violent cases, in four or five days, follows, with death.

In this, as in most fevers, the brain bears the onus, denoted by pain, giddiness, tinitus aurium. As in most, the stomach also early sympathizes, indicated by nausea, vomiting, pain. In violent cases, delirium is often early present, often during the second, or even the first night. At first, it may be partial, or only apparent on coming out of sleep, but if unchecked or obstinate, soon constant and furious. In some, it is demonstrated by incoherent talking, in some, by staring vacantly and wildly, and in others, by violent attempts to get out of bed.

In severe cases, the first stage, or that of excitement, is composed of one paroxysm only, with little or with no diminution. In more moderate, or more protracted ones, more paroxysmal; or every twenty, or twenty-four hours, paroxysms, but imperfect or irregular, follow each other, with corresponding remissions. Towards the afternoon or evening, exacerbation takes place, marked by chills, increased restlessness, increased pain about the eyes or temples—increase in the fullness, firmness, and frequency of the pulse—dryness and burning of the skin, thirst, delirium. Towards midnight or morning, some remission in the intensity or force of the heat, headach, and other symptoms occurs, but to be renewed again in the evening.

Fever is naturally paroxysmal. In mild, moderate, protracted cases, one exacerbation, and one corresponding remission, generally takes place every twenty-four hours,—towards the afternoon exacerbation, and towards midnight remission. In violent inflammatory tropical cases, however, one stage is one paroxysm, or the first stage the first paroxysm, and the second stage the second or last; excitement in such being generally too high for remission, but goes on undiminished to death, or the second stage.

The first stage, or that of excitement, varies in duration. In young unassimilated constitutions, and violent cases, it may be over in two, three, or five days; but in moderate protracted ones, and seasoned subjects, extend to ten or twenty, but influenced always by age, constitution, and treatment. In proportion to its violence is its duration, or the higher the excitement the shorter it lasts, and the more moderate the longer. To extreme action, if not arrested, succeeds, and that rapidly, exhaustion with disorganization, or the second stage. In violent cases, the transition from the first or inflammatory, to the second, last, or typhoid stage, is often rapid; ten, twelve, or twenty-four hours only intervening between the height of excitement and depression.

In severe cases, in two, three, or five days, provided the disease has not been arrested, heat, and headach lessen, mitigation takes place, in pain, in delirium, in the frequency and hardness of the pulse, and other symptoms, a calmness sometimes sudden, sometimes more gradual steals on, and sometimes with appetite,—hope then brightens, but it is only for a moment, it is the interim, or the transit only, not the turn to recovery which intervenes between the termination of the first, or stage of excitement, and commencement of the second, or typhoid.

In the second or typhoid stage, new symptoms and new feelings arise—in place of excitement, atony, or depression prevails. Through action in excess, nervous energy or tone, has become paralyzed. The pulse, from being full or hard, becomes soft, feeble, fluttering, and increased in frequency; delirium, from being high or furious, becomes suddenly muttering and low; pains and thirst cease, the tongue, from white, becomes brown, black, dry, and hard. To these, and with rapidity, are added subsultus tendinum, continued incoherent talking, catching at the bed-clothes, or something imaginary, imperfect vision, coldness or clamminess of the limbs and body, apathy, sometimes restlessness, vomiting, sometimes incessant, of green, black, or bilious looking matter, debility rapidly progressive, involuntary discharges, shrinking of the features, death.

The ejection from the stomach of black grumous coffee-looking matter is not continuous or constant, only occasional, and may be either inconsiderable, or copious and constant, throughout the whole of the second stage.

This fever, like others, varies in duration, it may terminate in three days, or not in three weeks; influenced by climate, age, and constitution, and by the treatment adopted. In young plethoric subjects who are unassimilated, it is usually most violent, most intractable, and often fatal, terminating in two, three, or four days; but in the seasoned constitution more moderate, and more protracted.—Fever, once fully formed in sympathy, association, and tendency, is not, particularly in such violent obstinate cases, easily overcome; and only to be so where it can be, by measures suitably, and with energy, applied.

Appearances after death in this fever are, congestion in the cerebrum and membranes—the lungs and linings — stomach — liver—spleen—visceral enlargment with reddening.— Serous, or sero-sanguineous effusion, in the viscera or cavities superficial or interstitial—the consequences of congestion with obstruction. If blood escaped out of a viscus as fast and as freely as it went in, it is quite obvious no congestion and no obstruction would or could occur. In fever and febrile action, to acceleration in the action of the heart and arteries, congestion in some part or viscus in general follows, and to that, if unrelieved, obstruction and effusion, indicating inequality of visceral or capillary action, or the want of that unison or uniformity between the action of the large and that of the small or capillary vessels necessary to health.

Treatment.—Health is invaluable, soon lost, but with difficulty regained. What may be necessary as to regularity, clothing, and diet, towards maintaining or improving health in one, is equally so in a thousand, but in that proportion the larger number bears to the small. Health differs on different stations, in different ships, and even in the same at different times, arising from the difference of constitutional ability—of cleanliness, of sobriety, of regularity, and of the duties required. Some ships have always, from the first to the last day of their commission, a large, and others always a small sick-list. The higher, or more perfect the discipline of the ship, the smaller infallibly will be the sick-list, and the greater her ability—the amount and kind of sick being the tell-tale which will indicate indubitably, in most, the order of the ship, the management, the efficiency, the oganization, the character of the officers, and that of the men. The sick-list is operated on, or influenced variously. It is influenced by the youth, age, and seasoned or unseasoned state of the crew,—by cleanliness—by ventilation—by sobriety—by regularity—and by the officers, their temper, manner, and mode of management.

A ship, to be healthy, and to be efficient, for health is strength,—and without it there can be no efficiency—must be clean, must be clear, rid of every thing unnecessary or superfluous, dry, and well ventilated, and particularly in a tropical climate. When fever springs up in one ship, and exists in no other at the time, as in the Eclair, and without any obvious or distinct cause, the sooner she is cleared out and cleaned the better. It will purify her, will sweeten her, will remove the material or nucleus of decomposition, and will at least moderate virulence, if it does not at once remove it. But then, to be efficacious, it must be complete, or every thing within her, from the limbers or keelson upwards, must be turned out, washed, white-washed, aired, and dried. Had this principle been acted on at the first in the case of the Pyramus, and a hundred others besides, how much of health, of life, and ability to the service, might have been saved, and how much, as it subsequently proved, of death and disease obviated?

Accumulated decomposing matter, the source of disease, may be above the limbers, or within them, or both. In the first, clearing and cleaning the holds would be successful,—in the last, useless.

Of accumulations within the limbers, the Pyramus was a sample. The following, of that without:—In the year 1817, and for about a year before that, the Pique, a frigate, was employed on the Jamaica station, and had generally during that time been healthy. Catarrhal and synochial cases, from solar exposure, or atmospheric changes, or some indiscretion, as in most ships, had occasionally occurred, but nothing diffused or malignant. About July of that year, the ship was ordered to Vera Cruz, and up to her arrival there, it must be remarked, was in her ordinary state of health. At this place, cochineal, a very decomposing substance when wet, was taken on board, in considerable quantity, in raw or untanned hides, in open boats, and in close rainy weather, and, wet or soaked, and softened as it was, stowed below in the after-hold and spirit room. The temperature at this time ranged from 80° to about 100°. Except on duty, none of the crew ever landed, and only during the day, and all, except a very few of the officers, always slept on board. Eight or ten days after leaving this place, and while at sea, fever suddenly and unexpectedly, and without any apparent cause, broke out, and soon became general. Men in good health, and all ages, began to be affected, were suddenly and unaccountably attacked with headach, fever, and delirium. At all hours, to our surprise, applications for assistance began to be made, and in a fews days the main-deck of the frigate, usually clear, became, through increasing numbers, everywhere crowded with hammocks, cots, and sick men, and the sick-list, averaging in general from about eight to ten, mounted and rapidly, to forty, fifty, and sixty.

What then was the cause, became the first and important question? Discipline, system, temperature, were all the same they ever had been, therefore, it could not reasonably be imputed to them. No other ship in the squadron was attacked in the same way, therefore, the disease was not an epidemic.

On reaching Port Royal harbour, the holds were cleared, but not on the score of health, to get at the cochineal and other matters. From all parts, fumes, fetid and offensive issued, and which for some time had been felt.

The bales of cochineal at the bottom. which had been wet at first, through heat and confinement, it appeared, had become putrid and decomposed. The holds were cleaned, washed, white-washed, and ventilated, and the disease ceased.

The following also is one of accumulation and morbid formation without the limbers, of a nature different from the preceding; but one, it is to be particularly noticed, much more frequent, therefore much more important:—The Salisbury, a two-decked fifty gun ship, during 1817, and for a year or two before that, bore the Admiral's flag at Jamaica; she had always been looked on as a clean and healthy ship. Fébrile cases, from irregularity, exposure to the sun's influence, as in all ships, had occasionally occurred, but nothing general or diffused. About the middle of 1817, she was ordered to the Spanish Main. In the neighbourhood of Portobello, a flat marshy tract, she watered and wooded, taking on board a large quantity green, soft, rank, and vegetating, cut from the forest around, and either during, or soon after the rainy season. Two or three weeks from this, being then in Port Royal harbour, cases of fever began to appear, spread, and in a very short time became general, and particularly among such as slept below, in cabins, tiers, or cockpits.

During the progress of this malady, a very great proportion, probably half the crew, became affected. Of these, many died, and many with difficulty recovered, and without any respect as to age or habits. Among the gun-room officers, or midshipmen, who slept in the cockpit, it spread, and most severely; some died, and some recovered with difficulty; but it must be particularly remarked, and worthy of notice, no case occurred with the Captain and Wardroom officers, who all, at that time, slept on the main-deck. This was no temporary attack,—it lasted two, three, or more months, and one, two, and even three, dying daily. What was the cause, became again naturally the question? The disease existed in no other ship at the time, therefore, it could not be an epidemic. Did it proceed from locality, as in the Pheasant and Phœnix? Was the germ, its cause, inhaled at Porto Bello, and evolved at Port Royal? It certainly would appear not, because those who had been on shore, and those who had not, became indiscriminately the victims. Did it originate in the ship? To this several circumstances concur. In the first place, it was general only in this ship, and particularly among such as slept or lived in or about the tiers, cock-pits, or lower parts. In the second place, cases of fever continued to occur, not only among such as had been on the Spanish Main, but among new men, (as it happened with Mr. Saunders the pilot, in the case of the Eclair, who had embarked at Plymouth,) who had volunteered, or were drafted afterwards from other ships. Was this infectious? Here again it appears not, no restriction was ever imposed or thought of in this instance, and no case was ever transmitted out of the ship, or to any of the medical or sick attendants.

What then was the cause? is still the question. It was clearly, it would appear, something in the ship, and something placed there, either previous to quitting Port Royal harbour or after. For the first, no reason whatever could be supposed, as the ship, up to the time of her leaving, had always been healthy. It was not until she had quitted, or was about to quit, the Spanish Main, and taken on board green, rank, and vegetating wood, that she became unhealthy. It is particularly to be remarked, that this wood was not dry, inert, or deadened, as it ought to be, to fit it for a ship's hold, particularly in a tropical climate, but full of sap, capable, when subjected to stagnation and a high heat, of life and germination, or the evolution of noxious gas.

The introduction of wood, green, rank, and full of sap, into a ship's hold in a tropical climate, and particularly during the rainy season, is a proceeding to be, by all means, reprobated, being, to say the least, perilous in the extreme, and much more so than is commonly imagined or thought of. To this may be attributed, and with reason, many of those cases of fever so intractable and fatal, and in hot climates so frequent, and probably that of the Eclair. As still farther illustrative, another sample may be given. In the year 1815 the Regalia, a merchant ship, went on a trading voyage to the coast of Africa. This case, it may be remarked, is related by Dr. Ferguson, army inspector of hospitals. When she sailed from England the ship's crew were all healthy, and so continued all the voyage, and all the time they were there. Headachs, and other trivial cases of that nature, occurred from exposure to the sun or weather, but nothing farther. Previous to leaving the coast she wooded, and a large quantity of it, green and vegetating, cut in the woods on shore, was taken on board and all stowed below, of course, in an atmosphere hot, close, and stagnant. The ship was bound to Barbadoes. Up to the time of her leaving the coast, and for about a week after, she still continued healthy, but from this, cases of fever, and both violent and intractable, began to appear, and spread rapidly. In about two weeks more from this time, on her arrival at Barbadoes, from the ravages and rapidity the disease had made, she was then found in a condition the most deplorable and alarming, several of the crew had died, several more dying, and all, more or less, ill. The cause and circumstances of the case became immediately the subject of investigation.

On clearing the ship, and which was immediately and very properly undertaken, it appeared that the wood, in the bottom of the hold, which had been green and soft when taken on board, had become in this short space, that is, in about two or three weeks, through heat and confinement together, putrid and decomposed. From all parts of the ship's hold effluvia, fetid, offensive, and noxious issued. The ship was cleared, cleaned, and ventilated, and the disease, of course, disappeared. Wood, it is here particularly to be remarked, introduced into a ship's hold, whether for firing or other purposes, ought to be incapable of change, dry, hard, and particularly in a tropical climate. Soft, green, and vegetating, cut from the forests on shore, and stowed below, as it commonly is, is a proceeding the most perilous, and one which, it is necessary to say, cannot be reprobated too strongly.

In no disease has treatment been more changed, or opposite, than in tropical inflammatory fever. By some, blood-letting and antiphlogistics have been considered the sheet-anchor. By others, stimuli and tonics. In this, as in all other diseases, remedial measures, to be useful, must be applied with discrimination. In this fever two stages, and generally very distinct, exist—in the one excitement, in the other depression. In the one, blood-letting, and measures of that nature, become practicable and proper,—in the other, inapplicable.

The remedy certainly the most approved, and most useful during the synochal stage, is blood-letting, but then, to be serviceable, must be early, and actively and skilfully employed, that is, during the first six, twelve, twenty-four, or at farthest, thirty-six hours. Bleeding, to be useful in such cases, must be impressive, or congestion and obstruction must be relieved. There must be an immediate stop put to morbid sympathy and association, and which bleeding, freely and impressively, can alone effect. Success, however, will be dependent, not only on the early adoption of bleeding, but on the quantity of blood drawn, and its proper repetition—heat, headach, and the pulse, must be relieved.

It is only at the commencement, it must be particularly remarked, or during the inflammatory stage, that bleeding is or can be of any avail. In no disease is delay more dangerous, much, therefore, will depend on energy and judgment. In most cases, bleeding is imperative during the first stage, but improper during the second. A full bleeding at first, that is, twenty, thirty, or forty ounces, and more or less according to the capability of the constitution and age, drawn from a large orifice, during the first six or twelve hours, is in many invaluable, the morbid process through the shock given, being then arrested, or at once brought to a stand still.

In severe tropical cases, the fever, during the first six hours, may be said to be forming, and capable in some measure of arrest, or a break up; during the next six, formed; and during the next six, or in eighteen hours only from the commencement, formed, fixed, and irrevocable; hence the danger of delay or half measures. The disease, by that time, in such violent obstinate forms, may be moderated, and still utimately by skill and proper means overcome, but not arrested. By this time congestion, and with that obstruction, has in some form or part, in all probability, taken place, and which not only reacts on the nervous and vascular system, but on each other.

Bleeding, it has been already remarked, is only proper during the inflammatory or first stage, that is, during the first, second, or third day, and then, to be beneficial, must be done with decision and liberally. Symptoms or circumstances must regulate in all cases, both the time and the quantity. Twenty, thirty, or forty ounces, according to the age, constitution, or habits of the patient, may be considered at first a proper bleeding; but, to be useful in such, must be at once drawn, or repeated if necessary, and to the same quantity, at intervals of four, six, or eight hours, till the symptoms, or heat, headach, and the pulse give way. Nothing can be more improper or unprofessional, than bleeding, particularly in a general way, in a stage advanced or exhausted. Opprobium is not justly imputable to this as a remedy, itself, one of the most invaluable in tropical inflammatory fever, but to the manner or time adopted, or the want of discrimination which, with too many, it has been practised. In extreme cases and youth, in the West Indies, or coast of Africa, sixty, seventy, and even eighty ounces of blood, have been drawn, at one sitting, and with benefit; but it must be remarked, such bleedings are extreme, and no rule for ordinary guidance, and which circumstances and judgment alone must direct. In most, it is safer and more consonant with prudence, without the symptoms are all the more urgent, and demand such large bleedings, to draw at first moderately, and then repeat, than at once too largely. In this manner, time will be given to investigate the case, the constitution, or the changes induced.

To relieve the cerebrum, in all fevers, but particularly in this a sufferer, blood has been drawn from the temporal artery, sometimes conjunct with general bleeding, sometimes without it, a mode much in fashion at one time in the West Indies. This is objectionable, and for several reasons.—Pressure, or weight about the head, from bandages or coverings of any kind, is, on all such occasions, irksome and disagreeable.—The flow or determination of blood to the head, in most fevers, but particularly in this, so serious, is not checked or counteracted, by drawing from the temporal artery ; on the contrary, by the flow or current upwards, rather if anything promoted or increased, or there is no revulsion or counterflow, as in venesection.—Punctures in arteries are often difficult to heal, always more so than in veins.—Those at the bend of the arm, in venesection, in most persons heal readily, but in the temporal artery, often with difficulty, or terminate, and that not unfrequently, in aneurism.

In most cases, bleeding from the bend of the arm is the mode to be preferred, the most convenient and most impressive, but, to be so, must be liberal, from a large orifice, and in the sitting or upright posture. In this position it is more immediately effective, and indicates more readily than in any other the patient's strength.

Regimen, no less than medical treatment, becomes indispensable. At the first onset of this disease, grog, and all ship's allowance, must be stopped, and nothing admitted during the first stage or excitement, but aliment the lightest and blandest—arrow-root, sago, barley-water. During the latter stages, or exhaustion when the powers of nature sink, something more reparative and sustaining will then be required. To appease thirst, and satisfy the cravings of a morbid palate, drink in every variety, and without restriction, will be necessary—lemonade, tea, toast and water, barley-water. Cleanliness in person, and in bedding, and in every shape, becomes indispensable—ablution of the face, feet, and hands, or if necessary or practicable, of the whole body, morning and evening—frequent, and if necessary, daily changes of body and bed linen. In cases of danger or difficulty, a cot will be necessary, always more convenient and far more comfortable, both for the patient and sick attendant than a hammock, and, when necessary, a watch. Ventilation, in all cases, it need scarcely be remarked, must be pure, dry, and unrestricted.

In most diseases, purges take precedence in the treatment; here, however, particularly in violent inflammatory forms, frequently bleeding. Purging, particularly the saline, is antiphlogistic, depletory, and only secondary in its effect to bleeding, and the most to be depended on, during the first stages of fever or phlegmasia. Sulphates of magnesia or soda, tartrate of potass and soda, phosphate of soda, the lowering or sedative effect of either of which may be materially improved,—an object in all forms of excitement desireable, but particularly in this,—by the addition of one-fourth or one-sixth of a grain of tartarized antimony. Five, six, or ten grains of calomel made up with treacle into a bolus, followed in two, three, or four hours, by one of the preceding, in the infusion of senna, will form a useful, and in most an efficient purge,—or a linctus of jalap or rhubarb, or, if deemed preferable, a draught of either, may be given, as previously noticed.

By prompt and decisive treatment at the commencement, or while all is functional, much may be done. From thirty or forty ounces of blood, drawn the first day, or the first few hours, followed by six or ten grains of calomel, and a proper saline purge, more benefit, in all probability, will be derived, than from eighty the second or third. By this time congestion, and probably obstruction, in the brain, lungs, liver, or some other part, may have formed, or the case become irrevocable. Purging, to be effective during the first or inflammatory stage, must be copious, serous, and frequent,—two, three, or more motions daily.

The affusion of cold sea-water over the naked body, during the inflammatory or first stage, was a remedy at one time much practised in the West Indies, and often beneficially, particularly when coupled with bleeding and purging. It is one much to be commended, but, like bleeding and purging, only at first, —that is, during the first or second day. However transitory the effect of affusing cold sea-water over the body may be, still, the change from heat and feverish restlessness, to ease and calm composure, which is thereby induced, is, at the time at least, always soothing. During the first stage, while the temperature is high and steady, and febrile action unimpaired, from the shock given by the affusion little need be apprehended; but in the advanced, or typhoid, would be hazardous, or altogether improper. When it is admissible, the remedy is to be practised by pouring or affusing several buckets of cold sea-water over the naked body, from the head downwards, the patient at the time sitting erect or standing, and one, two, or three times, during the day, then wiped and placed in bed.

Bleeding, saline purging, and cold sea-bathing, may be accounted the pillars of treatment in this disease, —the remedies the most immediate and most effective, and, on the proper and timely application of which, much, if not every thing, will depend. With these also may be coupled counter-irritants and calomel, and then we have the entire battery at present known, capable of being brought into operation against this very formidable fever. In all cases much must depend on circumstances,—that is, age, constitution, and climate, but much also on the judgment, discrimination, and energy of the medical attendant, or the adaptation of these means properly and energetically to the varied wants of the case.

Calomel, or the chloride of mercury, as it is now termed, as a purgative and deobstruent, is, in many diseases, and in none more than this, invaluable. In violent forms, the first stage may be over in thirty, forty, or eight-and-forty hours, therefore before calomel as a deobstruent has had time to operate. By that time congestion and obstruction in the brain, lungs, liver, or some other viscus, may have taken place, and the fate of the patient sealed. In such, it is obvious that the weight of the treatment must rest, not on calomel, although also equally necessary, but on bleeding, purging, and cold affusion, or something more prompt and decisive. In more moderate, or more protracted cases, however, much may be gained through the rapid and judicious introduction of mercury into the system, in combination with bleeding and purging. Mercury and calomel in particular, however effected, has obviously great power over the capillary vessels, which it stimulates, and thereby unloads or relieves. In this fever time is every thing, and with it, the application of such means as are prompt and decisive. With bleeding, purging, and other measures suited to the first stage, the rapid and liberal introduction of mercury, calomel, or blue pill into the system, should be at once begun and continued till the gums become affected, or the symptoms or disease give way,—two, three, five, ten, or twenty grain doses, according to the urgency of the case, three, four, or five times daily.

In many diseases cupping or leeching is a principal, in others an auxiliary remedy. During the progress of fever, congestion of blood in the brain, liver, lungs, or some other viscus, often takes place, but varying in degree or extent. It may be simply a vascular fulness only, without obstruction, or it may be, as in advanced stages, that with stagnation. It may be only partial, or only membranous, or the whole visceral substance may be affected. Congestion of blood in the brain, so dominant in all fevers, but particularly in this, is always, from the delicacy and importance of the organ, alarming, indicated by heat, headach, and delirium, and terminating rapidly, if unchecked, in rupture or effusion.

By general bleeding at the beginning, alleviation of the more prominent symptoms will thus be in some degree, in most procured, or their intensity taken off, but yet something indicative of internal congestion may still remain, and which general bleeding may not, and local only reach—pain about the head, chest, or stomach, more or less acute—quickened pulse, thirst—restlessness—nocturnal fever, and followed, if unchecked, by effusion, or, in some form, disorganization. Cupping is not to all parts, nor at all times, applicable; leeching is more gentle, and, when practicable, that is, when leeches can be got, generally much more convenient. By one mode or other, however, when necessary, blood must be taken, and in sufficient quantity to relieve the congestion.

If the cerebrum should be the seat of congestion, and which it commonly is, the head must be shaved, generally one of the first steps in the treatment. The benefit derived through shaving the head is always materially improved, by the application of cooling, evaporant lotions,—heat, and cerebral action being reduced, and the system soothed. In all forms of fever, but particularly in this, shaving the hair is invaluable, and a remedy at the commencement not to be dispensed with.

In all cases, blistering at some stage is beneficial. Cantharidical or sinapismal applications to the nape of the neck, chest, or stomach, as the part congested may indicate, are always of service, but particularly conjoined with bleeding and purging,—in the first stage, through counter-irritation, or drawing from the part, to the surface—in the last, through excitement.

From saline antifebrifuge mixtures, or treatment of that description, little need be hoped for in this fever, —the violence of tropical inflammatory fever, in general, is too great—its nature too obstinate, to be stemmed or turned by any such means; only to be combated with any prospect towards success, by bleeding, blistering, and purges. Medicines of the class herein referred to, are cooling and diaphoretic, but feeble in their operation, and little to be trusted—solutions of nitras potassæ in 3, 4, or 5 grain doses—carbonas sodae, in 8 or 10—diluted seidlitz water—barley-water—lemonade—any, or all of these in succession, may be necessary, and may be given either in combination with anodynes, and diaphoretics, or without them. Nausea and vomiting are symptoms too common, and often too serious, to admit of antimonials as a remedy to be made general use of.

These are the principal remedies applicable during the first stage of tropical inflammatory fever. On the violence or moderation of which much, or, it may be said, all will depend, or a tone given to the second. If the constitution is sound, and the means proper, and properly made use of, the disease may give way, and convalescence follow ; but if the means used be dilatory, or inefficient, or time trifled with, the loss then may be irreparable, and the case, in all probability, fatal. During the first stage, time is every thing ; the period for action, and once lost, irrecoverable.

Convalescence may be speedy, or slow, depending materially on the nature of the case, the age, the habit, and the treatment. By the loss of blood, a shock is given to the constitution, but a necessary, and generally only a temporary one ; by the fever, one more serious, and generally more permanent. Debility from the loss of blood, although considerable, is of less consequence, and both sooner and more easily made up, than that from disease, the one being a temporary, the other a more permanent evil.

Sooner or later, or in three, four, five, or six days, according to circumstances, comes the second, typhoid, or low stage. This, in character and symptoms, is the opposite of the first, but its sequel, or consequence. The first is characterized by synocha, the last by typhus gravior. The approach to this stage is sometimes rapid, sometimes more protracted, but always sufficiently alarming—it consummates the whole, seals the doom, or settles the fate of the patient. On one of two states, and distinct from each other, this stage may depend. It may depend solely on exhaustion, or the loss of nervous power; this, in many, by care, skill, and stimuli, may be got over; or it may depend on something more morbid, or something not so easily removed—organic, or structural lesion.

Transition from the one stage to the other is generally circumstantial, depending on the nature of the case. In moderate or protracted cases, it is generally something gradual, but in violent ones rapid, or, with the subsidence of heat, headach, and delirium, the patient sinks—becomes calm, and even collected, although previously incoherent—the pulse, from being hard, becomes suddenly frequent, soft, and feeble—the tongue, from white turns hard, brown, and black, —ejections from the stomach, sometimes copious, sometimes more spare, take place, green, black, and bitter—eyes and skin yellow—perspirations clammy, cold, partial, or general. In violent, fatal cases, the downward progress becomes now in many fearfully rapid, or, with gigantic strides, death advances—tremors—low, muttering delirium—apathy—indifference to every one or thing—pulse thready, and feeble—catching at the bed-clothes, or something imaginary—features shrunk—extremities cold—eyes glassy, and half shut—involuntary discharges—short laboured breathing—convulsions—death. The case, perhaps, may be more protracted, or lingering, but the issue, although more distant, not the less certain. The nervous principle may be less rapidly exhausted, but the basis laid, of disease, organic, and fatal.

During the second or typhoid stage, the energy of the nervous principle must be, at all risks, upheld, this is to be effected by stimuli and suitable nutriment, but early and actively employed. Whatever is done in this stage must be done quickly, there is here no time for delay. The stimuli most eligible, and most proper at this crisis, are the diffusible—brandy, rum, wine, æther, ammonia, camphor, but, to be serviceable, must be freely and frequently given, regard being had to the effect produced, not the quantity. During exhaustion, torpor, or the latter stages of fever, as in this, stimuli may be given in quantities so large, and with advantage, that at other times would not only be improper but injurious.

Stimuli, internally given, may be materially augmented in their effect by warmth at the same time to the surface,—bottles or tins filled with warm water, bags with sand or salt, or by the application of blisters or sinapisms to the limbs or back, particularly the latter. Irritation of the cerebro-spinal system, by the application of sinapisms or turpentine, continuously or successively, to the whole extent of the spinal column, is much to be commended. By treatment of this description, energetically employed, the dormant energy of the nervous system may be once more roused, and by skill and care carried on to a successful termination.

Aliment, light and nutrient, in small quantities, and frequently repeated, becomes like stimuli indispensable. It is only the skilful combination and application of such measures, actively employed, that will, with any chance, at such junctures, succeed. Aliment then most suitable will be chicken soup, beef-tea, arrow-root, gruel, sago.

For allaying restlessness, generally during this stage so prevalent, narcotics become necessary, and these, conjoined with stimuli,—a double or a stimulant, and soothing, and generally a beneficial action being thus induced. To suit different tastes and different ages, variety, as it has been already remarked, and both in the form and article given, will be required,—opium, conium, hyosciamus, and with wine, rum, or brandy.

The bowels must be easy, neither too lax nor too much confined, a circumstance always of moment. During this stage, these must be acted on when they are, exceedingly delicately—purging, watery stools, depletory treatment, in any form, being in this stage wholly inadmissible. Aperients, only when such become necessary, are to be made use of, and of these the most gentle,—Ol. recini in small dozes—seidlitz powders—colocynth or rhubarb pills—one, or at most two, motions only, being daily procured.

The nervous principle being once roused by the use of the diffusible stimuli, and made competent for life and functional action, tonics, and with them a more generous solid diet, will then be demanded—infusions of gentian, quassia, colomba—solutio disulphatis quinæ—the various preparations of iron or zinc—beef soup, broiled mutton, broiled chicken, stewed pigeon, pudding, fish, suiting the taste or the state.

It has been already observed, that every ship has limber spaces, two in number, triangular, situated one on each side the keelson, ten, twelve, or more inches, according to the ship's size, in circumference, and commonly extending from stem to stern. The limber board forming the upper side, the ship's bottom the second, the keel the last. These spaces then may be considered the centre, or points towards which dust, water, or refuse tend, or where all that comes by gravity, or the ship's working from above, and all that penetrates the ship's bottom from below, verge and concentrate.

If the ship leaks, and few do not, here it comes, and if obstructed, stagnates, or if not, runs into the pump-well. If dust or refuse, of any description, lies in the seams or lining of the ship, here, through gravity and the ship's working, it comes and lodges,

—the limber spaces, therefore, being the covered ways, bogs, or drains, leading to the pump-well.

In the central, and most dependent part of the ship, is the pump-well,—to this water and matter of every description, and however or wherever introduced, flows, and from it, and it only, can be pumped up. This is in all ships of war closed in or boarded, forming in those of the line a large space.

From water, unmixed with other matters in the limbers, particularly in a cold climate, little might be apprehended, but stale or stagnant or mixed, particularly in a tropical one, consequences the most dire. If the limbers are clear, water, it is obvious, can never stagnate, but, however much or little, through the force of gravity, will trickle or run on towards the pump-well.

In every ship, accumulations of matter in the limber spaces, as we have seen in the Pyramus, from various causes, take place, in some more, in some less, varying with the period of the ship's commission, or water and refuse passed through. If the limber spaces were open only to water, then no deposition, and no accumulation of matter, it is obvious, could occur, or it would run on into the pump-well as fast and as clear as it entered—this, however, is rarely the case. The limber spaces are open not only to water, but to dust and refuse of every description, and not only from the hold, or parts adjoining, but the whole lining of the ship's side. Whatever, then, is there, or gets there, will necessarily in time, through gravity and motion together, descend under the binding streaks, and ultimately into the limbers. Water, penetrating the ship's side, enters the water-courses or passages under the binding streaks. These vary with the ship's size, from a quarter to three quarters of an inch in depth, to one, two, or even three feet in breadth. Whatever, then, is there less than these dimensions, will readily, through gravity and the ship's motion together, descend, and from the very top-sides down to the limbers, where it is obvious every thing fluid or solid will tend, and there concentrate. The quantity of matter accumulated in the limber spaces in many ships, from friction, sweeping, and the various contents of orlops and holds, after three or four years' commission, when the ship comes to be paid off, would, no doubt, startle any one, amounting, as it frequently does, to buckets full of mud, black, blue, soft, and putrid, but varying in number always with the time the ship may have been in commission and her state.

From accumulations of this nature pent up, and stagnant in a ship's interior, it is not difficult to see, or rather not to be wondered at, that mischief should follow, and that to a fatal degree, as undoubtedly in a tropical climate it often does. In cold weather or winter, fermentation and germination is stopped, every thing then, through the absence of heat, the moving body, being fixed or fast. In tropical climates, it is different, through heat and moisture, life is given, or there succeeds to deposition, fermentation, emanation and disease.

However hazardous such depots of matter, to all concerned, may be, still, through the want of time or opportunity, it is not to be denied, may be often difficult to deal with. But, however inconvenient or troublesome clearing holds or limbers, for such a purpose, may be, still it must never be forgot, that health is strength, and without it no ship can be efficient; that trouble is never to be put in competition with disease; and that he who would command an able or efficient fleet or ship, must in the first place have a clean and healthy one. It must never be forgot, that ships and sailors, and these in health, are the right arm of Great Britain, the keystone of the arch, the basis of a mighty fabric,—and what are ships without sailors, and these in health to animate and give them force?—a city without inhabitant, a body without a soul. The limbers are rarely, or, it may be said, never cleared out, till the ship, after three or four years, comes to be paid off, unless necessity, as in the case of the Pyramus, compels it, when the quantity of mud and rotten stuff scraped out, would startle, and with reason, the most stoic. An operation of this description annually, or as often as circumstances or the public service will allow, would operate, and that most advantageously, and both towards health and comfort, and particularly in a tropical climate,—deposition would be prevented, and, thereby, emanation and disease. If fever, or disease of any description, springs up in one ship, and there general, and there only, or exists no where else, and not imputable to land effluvia, or an atmospheric cause, the sooner she is cleared and cleaned the better. We must look then not to infection, not to a body no one can find, but to a something more definite or more intelligible, to deposition and emanation, to the want of due cleanliness, due ventilation, to the state of the holds and limbers, to the sources from whence issue not infection, but the original febrile virus.

Clearing out holds and limbers is a proceeding, however necessary, it is not to be denied, is at all times troublesome, and very often inconvenient; but, as already remarked, trouble must never be put in competition with disease. On or over the limber boards rest the whole contents of the hold, water, stores, provisions, everything bulky or heavy, and, therefore, before these spaces can be got at or cleared, must be removed. At sea, or other places equally inconvenient, such might become necessary. To effect this, therefore, without disturbing the hold, and this might be often most desireable, must be an object. A rod of wood or iron, for this purpose, might be contrived. In the pump-well is an aperture, and the only one leading to the limbers, and through which alone such could be introduced and worked, or to which all matters must be drawn or scraped. The pump-well, compared to the limbers, is limited, and besides, bulk-headed, averaging in ships of the line from ten to twelve feet square. It is obvious, therefore, that no rod longer than ten or twelve feet, even in such, could be introduced, and which, as far as clearing the limbers was concerned, would of necessity be wholly useless, but it might be in pieces. The first piece six, eight, or ten feet long, according to the ship's size, being introduced, with a wooden or iron scraper attached; the second, fixed or screwed on would follow; then the third, and so on to any extent or number.

FINIS.

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